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Ceardchumann Dochtúirí na hÉireann

- 3 — **This Month**
- 4 — **IMJ Commentary**
- 4 — **Medical Staff Retention**
- 5 — **Editorial**
- 5 — **Research Skills in Medicine**
CS O’Gorman, MF Higgins
- 6 — **Original Papers**
- 6 — **Sleep Apnoea and its Relationship with Cardiovascular, Pulmonary, Metabolic and Other Morbidities**
F Khan, C Walsh, SJ Lane, E Moloney
- 8 — **Laboratory Test Costs: Attitudes and Awareness Among Staff in a Regional Hospital**
C Clancy, M Murphy
- 11 — **Organ Donation Following the Circulatory Determination of Death (DCD): An Audit of Donation and Outcomes Following Renal Transplantation**
J O’Rourke, JA Zimmermann, W Shields, D McLaughlin, P Cunningham, C Magee, DP Hickey
- 14 — **Perinatal Treponema Pallidum: Evidence Based Guidelines to Reduce Mother to Child Transmission**
B Freyne, A Stafford, S Knowles, A O’ Hora, E Molloy
- 16 — **Diversity in Prevalent PCR Ribotypes of Clinical Strains of *C. difficile***
E Brabazon, M Carton, R Sheehan, P Finnegan, D Bedford
- 19 — **Impact of EWTD on Teaching and Training in Irish Paediatric Medicine: Positive or Negative?**
DM Slattery
- 21 — **Case Report**
- 21 — **Mountain Bikers Priapism: A Rare Phenomenon**
J Ul Islam, R Browne, J Thornhill
- 22 — **Batteries not Included**
F Hand, D McDowell, J Gillick
- 23 — **First Birth Following Natural IVF/ICSI Treatment in Ireland**
S Detho, C Harrity, S Afridi, G Emerson, EV Mocanu
- 24 — **Research Correspondence**
- 24 — **A Holistic Assessment of Bariatric Surgical Outcomes in a Northern Irish Cohort**
KJ Neff, C Prener, LL Chuah, K O’Donnell, IF Godsland, AD Miras, CW le Roux
- 26 — **Attitudes of Parents and Staff Towards Medical Students on the Paediatric Wards**
A Duignan, C Kennedy, A Canas-Martinez, D Gildea, MA Jamaludin, M Moore, J Meehan, M Nadeem, EF Roche
- 28 — **Letters to the Editor**
- 28 — **Obstetric Medicine – Bridging the Gap**
A Akintola, M Tariq, H Zaid, J Farrelly
- 28 — **The Economics of Medical Education**
K Walsh
- 29 — **Osteoporotic Vertebral Fractures**
MB O’Connor, U Bond, MJ Phelan
- 30 — **Book Review**
- 30 — **The Impact of Immigration on Children’s Development**
K Viljoen
- 31 — **Continuing Professional Development**

Jon Baines Study Tours for 2014



Tales of the Raj - A Grand Tour of North India

1 - 15 March 2014

Dental Study tour to Cuba

3 - 13 March 2014

Palliative Care in South Africa

18 - 29 March 2014

Midwifery in South Africa

1 - 12 April 2014

Medicine in Cuba

3 - 14 April 2014

Optometry and Eye Care in South Africa

15 - 26 April 2014

Therapy and Rehabilitation in West China

27 April - 10 May 2014

Anaesthesia in China

10 - 22 May 2014

The Origins of Belief in Eastern Turkey

18 - 30 May 2014

A History Medicine Cruise in the Baltic

26 June - 10 July 2014

Ophthalmology in China

23 June - 8 July 2014

In the Steps of Florence Nightingale in England

10 - 15 July 2014

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1 - 19 September 2014

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13 - 26 September 2014

Paediatrics in Vietnam

13 - 24 September 2014

Florence Nightingale in Istanbul

14 - 18 October 2014

The Crimea and Kiev

18 - 23 October 2014

Medicine in Ethiopia

2 - 16 November 2014

Travel Medicine in Nepal, Bhutan & India

3 - 19 November 2014

Obstetrics & Gynaecology in South Africa

4 - 15 November 2014

Oman and Jordan

5 - 18 November 2014

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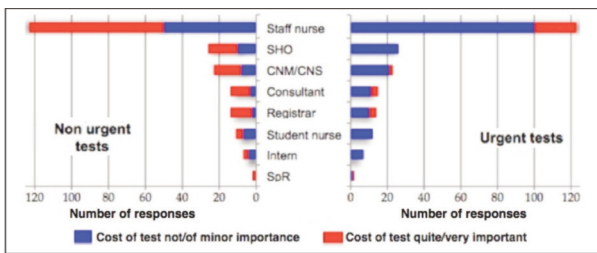
In this Month's IMJ

Sleep apnoea and its relationship with cardiovascular, pulmonary, metabolic and other morbidities:

Co-morbidities	OSAS group N = 139	Non OSAS n = 119	p value
HTN	46/139 (33.1%)	36/119 (30.2%)	0.688
Other cardiovascular diseases (IHD / Arrhythmias / Valvular Heart Disease)	25/139 (17.9%)	12/119 (10%)	0.255
Hyperlipidaemia	38/139 (27.3%)	30/119 (25.2%)	0.763
Diabetes	18/139 (13%)	10/119 (8.4%)	0.511
COPD	19/139 (13.6%)	13/119 (11%)	0.692
Asthma	24/139 (17.2%)	19/119 (15.9%)	0.852
Hypothyroidism	12/139 (8.6%)	7/119 (5.9%)	0.401
Reflux Disease (GORD/ Hiatus Hernia (H+H) / Peptic Ulcer Disease (PUD) / Gastritis		54/258 (21%)	-
Depression		28/258 (10.85%)	-

Khan et al report on a group of 258 patients who underwent sleep apnoea studies. 139/258 of the patients were suffering from obstructive sleep apnoea (OSAS). Patients with OSAS had higher rates of cardiovascular, metabolic and pulmonary co-morbidities. A BMI >30 was an important risk factor for OSAS.

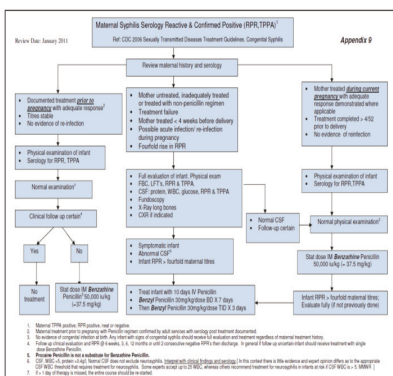
Laboratory test costs: attitudes and awareness among staff in a regional hospital: Clancy and Murphy surveyed medical and nursing staff to determine their awareness and knowledge about the cost of laboratory tests. Over three quarters of the staff were unaware of the financial implications of test ordering. The attitudes towards testing differed in relation to whether it was urgent or non-urgent. If the test was urgent cost was regarded as unimportant but in the case of non-urgent tests cost was considered quite important.



Organ donation following the circulatory determination of death (DCD): an audit of donation and outcomes following renal transplantation:

O'Rourke et al describe the role of the circulatory determination of death in organ donation (DCD). DCD is a process in which death has been diagnosed on the basis of cardio-respiratory criteria. This report describes 9 patients who died and donated 18 kidneys. Seventeen patients received a kidney transplant.

Code	Age	WIT (minutes)	CIT (hours)	LOHS (days)	Creatinine (Hospital Discharge)	Creatinine (months post Transplant)
1	45-55	45	18	10	186	154 (2)
2	55-65	45	15	10	252	174 (2)
3	65-75	30	17	20	205	185 (2)
4	20-45	40	11	19	339	126 (5)
5	55-65	40	16	26	370	167 (5)
6	55-65	28	14	13	224	98 (1)
7	55-65	28	18	14	219	115 (2)
8	45-55	24 ++	18	13	835	199 (2)
9	55-65	24 ++	22	14	502	198 (3)
10	65-75	45	17	14	306	108 (1)
11	55-65	45	18	14	258	109 (2)
12	45-55	30	13	16	325	115 (5)
13	20-45	30	18	22	375	130 (6)
14	65-75	16 ++	18	18	270	111 (12)
15	65-75	16 ++	20	19	260	129 (3)
16	65-75	38	18	19	260	62 (12)
17	65-75	38	21	19	PNF	Graft Recurrence Explanted



Perinatal treponema pallidum: evidence based guidelines to reduce mother to child transmission: Freyne et al audited the management of infants born to 58 mothers who had positive serology. 51% were accurately assessed, 12% partially assessed, and 36% incorrectly assessed.

Diversity in prevalent PCR ribotypes of clinical strains of C. difficile: Brabazon et al have undertaken ribotyping in 50 notified cases of C. difficile. The most common ribotype was O27 (24%), followed by O05 (16%). The exercise is useful for epidemiological mapping of C. difficile trends.

Ribotype	North East (Notified Cases)	% of Total (North East Project Notified Cases)	National Project (New Cases)	% of Total (National Project New Cases)
O27	12*	24.0%	17	21.25%
O05	8	16.0%	8	10.00%
O02	6	12.0%	1	1.25%
O78	5	10.0%	10	12.50%
O14	4	8.0%	8	10.00%
O08	2	4.0%	15	18.75%
Sporadic	2	4.0%		
O29	1	2.0%		
O03	1	2.0%		
O15	1	2.0%	2	2.50%
O22	1	2.0%		
O02	1	2.0%		
O48	1	2.0%		
O50	1	2.0%		
O56	1	2.0%	1	1.25%
O72	1	2.0%		
O01	1	2.0%		
O44			8	10.00%
O03			9	11.25%
O01			2	2.50%
O20			2	2.50%
O11			0	
O12			1	1.25%
O67			1	1.25%
O74			1	1.25%
Total	50	100.00%	80	100.00%

Impact of EWT.D on teaching and training in Irish Paediatric medicine: positive or negative: Slattery has examined the impact of EWT.D on postgraduate training. In a survey of NCHDs, 75% stated that EWT.D made it more difficult to attend the hospital for teaching sessions. 95% felt that it did not increase consultant teaching time. The author states that we need to rethink how we provide postgraduate teaching.

E.W.T.D. has an impact on teaching	Frequency n	Percentage %
Yes	13	65
No	7	35
E.W.T.D. made it more difficult to attend teaching	15	75
No	5	25
E.W.T.D. results in increased consultant led teaching time	1	5
No	19	95
E.W.T.D. results in reduced consultant led teaching time with NCHDs	11	55
Yes	9	45
E.W.T.D. resulted in increase registrar teaching time	1	5
No	19	95
E.W.T.D. resulted in reduced registrar teaching time	13	65
No	7	35
E.W.T.D. resulted in improved structured teaching programme	13	65
No	7	35
E.W.T.D. resulted in trainees being less tired at teaching	13	65
Yes	7	35
Early morning teaching sessions are easier to attend than evening sessions	16	80
No	4	20

Batteries not included: Hand et al report on 2 cases of oesophageal lodgement of ingested button batteries in young children. The early and late complications are described. Button batteries rapidly cause electrical burns, chemical burns and pressure necrosis. In cases with oesophageal lodgement it is important to achieve removal within 2 hours of ingestion.

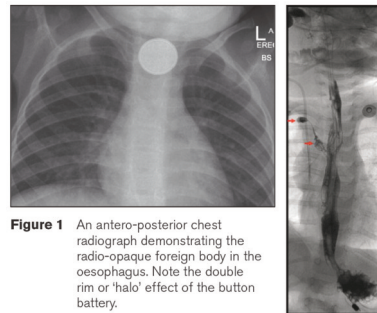


Figure 1 An antero-posterior chest radiograph demonstrating the radio-opaque foreign body in the oesophagus. Note the double rim or 'halo' effect of the button battery.

Figure 2 An antero-posterior chest radiograph demonstrating the leak of contrast postero-laterally (red arrows).

Domain	Pre-operatively (%)	Stage 0 (%)	Stage 1 (%)	Stage 2 (%)	Stage 3 (%)	p value
Airways	Pre-operatively 1.4	50.7	45.1	2.8	<0.0001	
BMI	Pre-operatively 47.9	40.8	19.9	1.4	<0.0001	
Cardiovascular	Pre-operatively 24.0	32.4	40.8	2.8	<0.001	
Diabetes	Pre-operatively 12.7	43.5	40.0	3.8	<0.001	
Economic	Pre-operatively 36.6	19.7	31.0	12.7	<0.01	
Functional	Pre-operatively 53.5	12.7	28.2	5.6	<0.001	
Gonadal	Pre-operatively 23.0	9.4	25.8	41.8	<0.001	
Health Status	Pre-operatively 62.0	8.5	7.0	22.5	<0.0001	
Image (body)	Pre-operatively 0.0	36.6	50.7	12.7	<0.0001	
	Pre-operatively 52.1	19.7	23.9	4.3	<0.0001	
	Pre-operatively 85.7	2.1	4.2	0.0	<0.0001	
	Pre-operatively 1.4	21.1	62.0	15.5	<0.0001	
	Pre-operatively 56.3	35.2	4.9	3.8	<0.0001	
	Pre-operatively 1.4	22.5	69.2	9.9	<0.0001	
	Pre-operatively 45.0	40.8	14.2	0.0	<0.0001	

A holistic assessment of bariatric surgical outcomes in a Northern Irish cohort: Neff et al described the outcome in 71 patients who underwent bariatric surgery for obesity. The patients benefitted across a number of medical parameters including cardiovascular, respiratory and gonadal. However those patients who had pre-existing diabetes benefitted the most.

Attitudes of parents and staff towards medical students on the paediatric wards: Duignan et al interviewed parents and staff about the presence of medical students on the wards. 87% of parents were happy to be interviewed by students and 74% were happy for the student to examine their child. An emphasis was placed on introduction, identification and dress. The findings are positive for the role and position of medical students on the paediatric wards.

Medical Staff Retention

Many hospitals throughout Ireland are facing 2014 with genuine apprehension about their ability to fill their non-consultant hospital doctor (NCHD) posts. The annual struggle to maintain medical continuity has been deteriorating for some years. Between 2000 and 2010 the number of foreign doctors that Ireland has needed to employ has increased fourfold. Correspondingly the proportion of Irish doctors seeking Medical Council registration fell from 86.6% to 66.6%. The problem is about retention rather than supply. The six medical schools in the State now produce over 700 graduates annually, which is the number recommended in the Fottrell Report. After graduation serious challenges arise. There are recent reports that approximately 50% of NCHDs did not renew their registration with the Medical Council. The deficit in Irish trainees has necessitated the increasing recruitment of overseas doctors. Currently more than half of the NCHDs in Ireland are non-Irish. This situation is untenable in the longterm. Irish graduates are leaving the Irish health service where they badly needed. On the other hand foreign graduates are being recruited from second and third world countries where their medical services are desperately required by their own populations.

The current NCHD workforce is 4910 doctors. The breakdown is 570 interns, 1810 SHOs, 1620 Registrars and 908 Specialist Registrars. 80% hold structured training posts and the other 20% of NCHDs hold service posts. In the coming year the number of intern posts will be increased from 570 to 639.

The high medical turnover that we are experiencing in the Irish health service is both expensive and sub-optimal for patient care. It results in increased training, induction and recruitment costs. There are knowledge and experience losses. There are increased pressures on the remaining workforce which frequently depleted. The health service risks getting a poor reputation among trainees which will further exacerbate the spiral of medical exodus.

The ability to staff the emergency medicine (EM) department is a good barometer of the availability of medical staff in a hospital or a region. The EM patient numbers cannot be curbed like other specialties where outpatient appointments and elective surgery lists can be reduced or postponed. Manpower shortages cannot be disguised in EM. The UK which currently has a problem with EM medical staffing has attempted to analyse the issues involved. In the UK the proportion of EM doctors emigrating to Australia has increased 69%. Doctors who have made the move state that they are better supported and less stressed. The experience in the UK is that the working hours have become more antisocial and financial compensation has been reduced. Others state that the work-life balance of hospital doctors is inferior to their GP counterparts. Some UK commentators have made the point that substantial sums of money have been spent on training doctors and that they owe taxpayers a period of 'pay back' service. The majority of recent correspondence in the BMJ does not agree. They point out that medical students pay a high price in terms of no gainful employment for 6 years, tuition and registration fees, books and equipment, food and accommodation. By graduation most students have accumulated a significant bank overdraft. The general conclusion is that retention cannot be controlled by regulation. The way to achieve sustainability is make work and training more attractive.

Ireland's problems are more widespread and involve more specialties than those in the UK. Irish hospitals have tried to deal with their recruitment problems individually and up to now there has not been a co-ordinated combined approach. This has resulted in medical facilities chasing after the same depleted group of NCHDs. The system has been slow to produce a national, effective proactive plan. The issue of excessive long hours and fatigue has been a major stumbling block for many years and until it is effectively resolved it will be difficult to move forwards. Following the recent industrial action co-ordinated by the IMO there is an expectation and fervent hope that the 'hours issue' will finally reach a satisfactory conclusion.

Discussions about the previous failed efforts to confront the recruitment problem are of little value at this point. It is now important to act quickly to stabilise matters. Two major players are the Colleges and the Medical Education and Training (MET) Unit. The Colleges play a fundamental role in planning and implementing the basic services training (BST) and higher specialist training (HST) programmes. MET under Eilis McGovern has stated that NCHDs feel isolated and uninformed. During 2012 she met with final year medical students in all 6 medical schools and in September a national training information day was held. Longterm medical manpower planning is perceived as an important task. McGovern has also stressed the importance of seamless training programmes. Anaesthesia is now seen as an attractive option because once a doctor gets on the programme he/she will get a 6 year training agreement. The HSE's second interim report found that the intern year needs further improvement. There are insufficient intern posts to match the expanded number of medical graduates. For the 2012 internship intake 1,000 applications were received for 560 available intern posts. Failure to have sufficient places has represented a missed opportunity to capitalise on the increased number of graduates. It is good news that the numbers are due to be increased. When interns were surveyed about their decision to leave Ireland they stated the following reasons, lifestyle choice, dissatisfaction with training structures, feedback from colleagues/ friends abroad.

Medicine can learn from industry about staff retention. Janssen has a high reputation in this area. Its key approach is attract, motivate and retain. The streams of interaction with employees are performance and recognition, personal development and career opportunity, and benefits. Development is provided 70% on the job, 20% feedback and coaching and 10% training.

Minister Reilly established a group chaired by Professor Brian MacCraith, DCU, to undertake a strategic review of medical training and career structure. The group published its interim report on 12th Dec '13. They had met with the key stakeholders including trainee doctors, the Medical Council, the IMO, the Forum of Irish Postgraduate Training Bodies and clinicians in senior HSE management. A number of interim observations were made. Trainee doctors reported that morale was low and that they felt undervalued by the health system. They stated that the 30% pay reduction for new consultants had impacted adversely on recruitment and retention. The balance between training needs and service requirements is too weighted towards the latter. Training time is not sufficiently protected for trainees and there is no protected time for the trainers. The use of doctors for non-core tasks such as clerical and portering duties was highlighted. The trainees felt that in some specialties the duration of training was too long. The significant paperwork involved in rotations between hospitals was criticised. Lack of mentoring and the need for a national strategic workforce plan was highlighted. The Report has made recommendations to address these issues.

The NCHD recruitment problem can be resolved. Some good plans are in place but they need to be implemented quickly. The resolution of the EWTD issue is an important first step. The role of the Colleges and the MET Unit in stream-lining the interface between training and service provision is very important. Graduates embarking on their postgraduate career expect that a clear pathway, similar to that developed in Anaesthetics and Radiology, is available to them. All NCHD posts need to be in training schemes so that teaching and service are closely linked. The plans to increase intern numbers and improve their training structures are welcome. During the internship year the newly qualified graduate reaches positive or negative perceptions of a health service and these impressions can be long lasting. The discrepancy in pay for newly appointed consultants must be addressed. All the training and service organisations involved with NCHDs must strive to communicate with them and consider carefully their concerns and aspirations. If these positive steps are

implemented nationally the reputation of Ireland as a good place for trainees can be greatly enhanced.

JFA Murphy
Editor

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Research Skills in Medicine

For some, health care professionals the word “research” invokes dreaded memories or intercurrent guilt about difficulties achieving targets on training schemes. For others, it incites excitement and enthusiasm, or pride in participation in past or present research studies. Some are probably still confused about what exactly constitutes research. Regardless, research is a fundamental part of our daily clinical lives. We read it (and we try to critique it to understand it better). We ask questions (or pose hypotheses) to search for evidence about the best treatments for our patients. Some design studies to prove or disprove hypotheses. Research is fundamental to ensuring good patient care.

Increasingly, medical school curricula demand that medical students achieve some degree of mastery of research – its theory, and to conduct and write up their own research studies or papers. This approach to teaching research empowers modern medical graduates. Sometimes, this happens at the expense of post-graduate trainees, who might not have had these skills delivered in their undergraduate curricula and instead may struggle to acquire these skills as post-graduates. But the evolution continues: it has been suggested that future medical graduates will not be asked to repeat learned information from memory – instead, they will be expected in medical school to equip themselves with the tools needed to pose clinical questions and to search for the answers, and then decide how relevant those answers are to their particular patient populations. Thus, research evolves into more actively participating, dynamic, reflective, critical research?

Albert Szent-Gyorgyi, Winner of the Nobel Prize in Physiology or Medicine in 1937 defined research as “... (Research) is to see what everybody else has seen, and to think what nobody else has thought.” This portrays research as universally accessible. For academic clinicians, H-scores and various other parameters are often used to mathematically define how frequently an author publishes, and the impact of these publications. These parameters matter to academics, to furthering careers and to seeking funding. And participation in research and contribution to knowledge is personally satisfying for some. But it is the pursuit of knowledge and the sharing of knowledge that has a holistic, global benefit to patients and to society.

In recent social media, there have been discussions that perhaps authors of medical blogs or other social media content should receive credit for this writing (credit as defined by continuous professional development points, for example). It is hard to predict the outcome of this discussion. Clearly, there are some blogs of exceptional merit. But, the advantages of the peer-review process are difficult to ignore. Not all research is Nobel prize-winning – but prize-winning is not the perfect metric by which the value of research should be measured. Research that is conducted rigorously and scientifically, with statistical merit, yields results that are valid and reliable. Importantly, whether the results suggest equivalence, inferiority or superiority is increasingly irrelevant to whether or not the results are finally published. Open access journals, often with authors paying for the publication of their studies, have yielded vast amounts of knowledge freely available to everyone. This is important in the increased publication of negative studies but this must be counter-balanced by the reader having the knowledge to pay attention to details of the study design, ensuring adequate peer-review and adherence to standards in research. For example, randomized controlled trials

should report their findings according to the CONSORT statement¹, allowing the reader to infer that the methodology also adheres to CONSORT standards.

The realities of research can be incredibly frustrating: from having lofty ideas and hypotheses that are not matched by lofty grant funding to under-resourced libraries where immediate access to journals is limited. Conducting scientific research involves commitment of intellect, time, energy and limited resources. Clinical research can be as frustrating as clinical practice – both rely on patients as clients. Bench research and clinical research may both involve unsociable hours – with samples maturing in the early hours of the morning. Some fear that their statistical skills are lacking and access to statistical support can be limited, outside of the University structures. Increasingly, though, participation in research incurs continuing professional development credits for clinicians – another incentive to overcome the frustrations! Furthermore, research engages the domains of clinical governance and reflective learning, both of which are important even outside their professional competency accredited skills.

It is easy to forget also that the skills of the researcher are entirely transferrable to so many other clinical problems. For example, writing a cohesive, comprehensive succinct argument in a research manuscript is not that different to writing a business plan, which puts for than argument for more resources, for example. Bringing a research project to completion, including publishing manuscripts and submitting a thesis displays certain characteristics that one might prefer in one's own doctor – for example, tenacity, determination, logic, higher order thinking, leadership and the relentless pursuit of mastery of a topic. Of course, there are many people who have these skills who have not written theses and manuscripts. Problem-solving is another skill required of the researcher – from determining how to get that elusive article (with or without the help of your local librarian) to where to accommodate clinical research patients on a busy clinical ward, to finding funding to keep your wet lab in operation.

Without doubt, research, as well as education, is fundamental in any medical institution. If we were to design the perfect hospitals in which to treat our patients, the areas for research and education would be at the very heart of the physical building. We do not frequently have the opportunity to redesign and rebuild buildings. Nonetheless, the principles of research and education should be at the heart of the institution – the heart defined by the people and the ethos in the existing institution. Not all research will win a Nobel prize– or any prize. But all research should strive to encourage reflection on local practice, seek to improve clinical decision-making, with an evidence base and ultimately improve patient outcomes. Aren't these the primary principles underpinning medical practice?

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Sleep Apnoea and its Relationship with Cardiovascular, Pulmonary, Metabolic and Other Morbidities

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To receive CPD credits, you must complete the questions online at www.imj.ie.

Abstract

Sleep apnoea (OSAS) is a multisystem disorder. There is a high prevalence of cardiovascular and metabolic morbidities in patients investigated for sleep apnoea. We aim to evaluate any association between cardiovascular, metabolic and pulmonary co morbidities in patients investigated for OSAS and whether clinical findings based on Epworth sleep score (ESS) and snoring helps in diagnosing sleep apnoea. 258 consecutive patients who were electively admitted for sleep assessment in Peamount Hospital, Dublin from Sept 2009 to Aug 2011 were retrospectively reviewed. 139/258 were diagnosed as OSAS. Cardiovascular, metabolic and pulmonary co morbidities were 46.12%, 37.2% and 29% respectively. There is no correlation found between ESS, Snoring with Apnoea Hypopnoea Index in OSAS group. Screening for OSAS should be considered in patients with certain cardiovascular and metabolic disorders. PSG is so far considered the gold standard investigation to diagnose OSAS and better clinical evaluating tools need to be formulated.

Introduction

Obstructive sleep apnoea syndrome (OSAS) is characterized by recurrent episodes of apnoeas and hypopnoeas due to complete or partial collapse of the upper airway during sleep respectively. Different screening programmes in America, Europe and Australia have shown that there is a remarkable proportion of the adult population suffering from mild-to-moderate sleep-disordered breathing.^{1,2} The foremost common risk factor of rising prevalence of OSAS is obesity. Studies have consistently shown that body mass index (BMI) is the strongest risk factor for OSAS. Almost 70% of those with OSAS are obese and its prevalence in obese men and women is about 40%.³ A large neck circumference is also associated with an increased risk of OSAS. Infact, neck circumference of 15.7 in (40 cm) or greater may have a greater sensitivity and specificity than BMI in predicting OSAS, regardless of the person's sex.⁴

OSAS affects multiple organs and systems particularly the cardiovascular system. Several conditions associated with OSAS are also present in obese individuals including hypertension, insulin resistance, systemic inflammation, visceral fat deposition and dyslipidaemia. Weight loss has been accompanied by improvement in characteristics related not only to obesity but to OSAS as well; suggesting that weight loss might be the most vital step in the management of both conditions.⁵ Over 5000 European sleep apnoea patients' database suggested high prevalence of cardiovascular and metabolic morbidities among them. It has also been mentioned that sleep-disordered breathing is likely to be a risk factor for hypertension and consequent cardiovascular morbidity in the general population.⁶ As we know excessive daytime sleepiness, snoring, and fatigue are the major symptoms of patients with OSAS, there are few scoring systems drawn to quantify those symptoms, Epworth Sleep score (ESS) is one of them. The validity of this questionnaire and its relationship with sleep studies is still questionable.⁷

We sought to determine whether clinical findings based on ESS help in diagnosing sleep apnoea and we also aim to evaluate any association between cardiovascular, metabolic and pulmonary comorbidities in patients investigated for sleep related disorders.

Methods

A retrospective two years review of 258 consecutive patients who were electively admitted for sleep assessment in Peamount Hospital, Dublin from Sept 2009 to Aug 2011 was performed and analysed using statistical software R version 2.12 [cite R Development Core Team (2010). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL <http://www.R-project.org/>. Patients admitted to the study included all those that were more than 20 yr of age, symptoms of daytime somnolence, fatigue, snoring history, and high ESS. Patients with unstable angina, liver cirrhosis, end-stage renal disease, haematological

disease or diagnosed cancer were excluded. Their general characteristics on admission including calculated ESS are shown in Table 1.

All the patients underwent polysomnography (PSG). Standard overnight PSG was performed to document sleep parameters and architecture in each patient in a sleep laboratory. Variables are manually recorded in the quiet and darkened room.

Their PSG variables were calculated to formulate the diagnosis of sleep apnea and categorize it accordingly. Apnoea is defined as more than 90 percent dropping of baseline airflow with continued chest wall and abdominal wall movement for a minimum of 10 sec, regardless of whether or not there was an associated oxygen desaturation or sleep fragmentation; baseline is defined as the mean amplitude of the three largest breaths in the two minutes preceding the onset of the event. The definition of hypopnoea was a 50 percent or greater reduction in airflow for a minimum of 10 seconds, associated with an equal to or greater than a 4 per cent drop in SpO₂ or an EEG alpha wave arousal.⁸ The definition of desaturation episode was equal or more than a 4 percent drop in SpO₂, which was induced by apnoea or hypopnoea events. Apnoea hypopnoea index (AHI) was the number of apnoea plus hypopnoea events per hour of total sleep time, and desaturation index (DI) was the number of desaturation episodes per hour of total sleep time. AHI helps in defining and grading the severity of OSAS. An AHI of less than 5 is considered normal; 5-15 is mild; 15-30 is moderate; and more than 30 events per hour characterises severe sleep apnea.

The medical notes of all 258 patients, who had PSG, were reviewed. Among them, we further analyzed the prevalence of cardiovascular diseases including Hypertension (HTN), Ischaemic Heart Disease (IHD), Valvular Heart Disease, Arrhythmias; Pulmonary diseases including Asthma, Chronic Obstructive Pulmonary Disease (COPD); Hyperlipidaemia; Endocrinological diseases including Hypothyroidism, Diabetes; Gastroenterological diseases including Gastritis, Gastroesophageal Reflux Disease (GORD), Hiatus Hernia (HH), Peptic Ulcer Disease (PUD) and Depression.

Table 1
General Characteristics of patients enrolled for PSG

Variables	Mean ± SD
Age	51.08 ± 12.9
BMI	33.7 ± 7.45
Weight	95 ± 23.1
ESS	9.5 ± 5.4
Gender (M/F)	165/93
Smoking	43.75%

*Data is presented as Mean +/- Standard Deviation (SD) unless otherwise indicated.

Table 2 Significance of PSG variables in diagnosing sleep apnoea

PSG Variables	OSAS (n = 139)	NON OSAS (n = 109)	p value
AHI	23.2 ± 20	2.64 ± 2.4	< 0.0001
DI	25.4 ± 26.7	3.27 ± 3.7	< 0.0001
T < 90	12.86 ± 20.23	1.90 ± 1.0	< 0.0001
Microarousals / Hr.	26.75 ± 18.5	16.67 ± 11.7	< 0.0001
Movements / Hr.	29.5 ± 24	21.3 ± 22	< 0.0001

Results

The patients were divided in Sleep apnoea (OSAS) and non sleep apnoea (NON OSAS) group on the basis of their PSG variables as shown in Table 2. Of 258 patients, 139 (77.6% males, 22.3% females) are OSAS and 119 (47% males, 54% females) are NON OSAS. As per AASM criteria⁹ for scoring sleep apnoea, our OSAS group was further divided in mild (56%), moderate (24%) and severe (20%) sleep apnoea. In OSAS group, there are strong correlations found between age ($p=0.045$, $r=0.162$), sex ($p=0.0002$, $r=0.296$), BMI, and smoking history showing an increased prevalence of sleep apnoea in elderly, obese, male smokers but there is no correlation found between ESS ($p=0.743$, $r=0.026$), with AHI. As sleep experts know, females with OSAS exhibit a lower AHI, less severe hypoxaemia and greater BMI. Similarly in NON OSAS group, there is no correlation found between ESS ($p=0.965$, $r=-0.003$) with AHI as shown in the Table 3. It reconfirms the statement that all snorers are not sleep apnoeic and sleep apnoea can not entirely be diagnosed with clinical evaluation sleep scores.

Variables	OSAS	NON OSAS	p value
Gender	M = 108 / F = 31	M = 56 / F = 63	< 0.0001
Age	53.54 ± 12.4	48.29 ± 13.1	0.001
BMI	34.37 ± 7.8	30.7 ± 6.5	< 0.0001
Weight	101.8 ± 24	86.9 ± 19.1	< 0.0001
Smoking	43.75%	36.97%	0.054
ESS	9.72 ± 5.4	9.26 ± 5.5	0.529

In addition, the prevalence of co-morbidities was split into two major stems of OSAS and NON OSAS. It showed higher prevalence of cardiovascular diseases in OSAS group (51% vs 40%) especially HTN, metabolic disorders including diabetes (13% vs 8%), hyperlipidaemia (27.3% vs 25%) and hypothyroidism (8.6% vs 5.8%) in comparison to NON OSAS group as shown in Table 4. It is also found that respiratory diseases including COPD and asthma are also slightly more prevalent in OSAS group than NON OSAS but less frequently as compared to metabolic and cardiovascular diseases.

A statistician has been consulted and a multivariate model has been fitted to identify factors jointly associated with OSAS. In order to determine the factors that influence the presence of OSAS in a multivariate model, a backwards stepwise logistic regression was fitted. Factors entered included ESS, Smoking, Age, BMI and Gender. In the final model Age ($p=0.001$), Gender ($p<0.0001$) and BMI ($p<0.0001$) were statistically significantly associated with OSAS.

It is also analyzed that there is a relatively higher prevalence of depression 28/258, (10.8% vs 8.5%)¹⁰ in all patients enrolled for PSG, as compared to the general population, who do not have exhibiting risk factors for PSG enrolment. In addition, 54/258 (21%) of all high risk sleep apnoea patients suffer from gastrointestinal disorders. Sleep apnoea cannot only be diagnosed clinically; PSG is so far considered the gold standard investigation to diagnose OSAS. In general, OSAS is more common in elderly and obese, male smokers. There is a higher prevalence of cardiovascular, pulmonary and metabolic co-morbidities in high risk sleep apnoea subjects.

Co-morbidities	OSAS group N = 139	Non OSAS n = 119	p value
HTN	46/139 (33.1%)	36/119 (30.2%)	0.688
Other cardiovascular diseases (IHD / Arrhythmias / Valvular Heart Disease)	25/139 (17.9%)	12/119 (10%)	0.255
Hyperlipidaemia	38/139 (27.3%)	30/119 (25.2%)	0.763
Diabetes	18/139 (13%)	10/119 (8.4%)	0.511
COPD	19/139 (13.6%)	13/119 (11%)	0.692
Asthma	24/139 (17.2%)	19/119 (15.9%)	0.852
Hypothyroidism	12/139 (8.6%)	7/119 (5.8%)	0.401
Reflux Disease (GORD)/ Hiatus Hernia (HH)/ Peptic Ulcer Disease (PUD)/ Gastritis	54/258 (21%)		—
Depression	28/258 (10.85%)		—

Discussion

A large proportion of adult patients who are referred to sleep disorder centres have excessive daytime sleepiness. ESS is a simple, self administered questionnaire which provides a measurement of person's day time somnolence. The majority of older adults (almost 60%) are unable to answer all of the ESS question stems. It may underestimate sleepiness severity in older subjects.¹¹ In order to confirm the presence of upper-airway closure during sleep and to assess the patient's level of risk of OSAS, we need to perform a full PSG.¹² OSAS is an independent risk factor for hypertension¹³ with 30% prevalence of occult sleep apnoea among middle-aged males with so called "primary hypertension". The results of our study identified similar results in the Irish population, showing a 33.1% prevalence of hypertension in OSAS group.¹⁴ Peppard describes the more severe the sleep apnoea, the higher the prevalence of hypertension.⁶ OSAS-related hypertension is predominantly diastolic and nocturnal, affect non-dippers, treatment resistant and high risk of the formation of arterial lesions.¹⁵ Further described Continuous Positive Airway Pressure [CPAP] ventilation not only plays an important role in treating OSAS but also appears to be significant for refractory HTN.

Metabolic disorders in OSAS has been studied and shown a close relationship between OSAS and increasing prevalence of hyperlipidaemia.¹⁶ There is 33.8% prevalence of hyperlipidaemia in OSAS population and it is independent of gender difference, likewise in our study a 27.3% prevalence is identified.¹⁷ There is 10.6% prevalence of more than one metabolic disorder including HTN, hyperlipidaemia and diabetes in patients suffering from OSAS¹⁸, as compared to 13.1% in our Irish cohort.

Considering pulmonary complications in OSAS, Flenley described combination of COPD and OSAS as Overlapping syndrome [OS] which is characterised by hypoxia, hypercapnia, pulmonary arterial hypertension and nocturnal hypoxemia.²¹ It is estimated in general population that about 325,000 (7.3%) people suffer from COPD in Ireland.¹⁹ In the European Union, general prevalence of COPD lies in the range of 4 – 10% as per EUPHIX summary in December 2009.²⁰ COPD prevalence, in our sleep apnoea patients is 13.6%, which correlates closely to international findings. OSAS is an independent risk factor for asthma exacerbations. Likely explanation of increased frequency of asthma exacerbations and poor control in OSAS are neuromechanical reflex bronchospasm, gastroesophageal reflux disease, local and systemic inflammation and OSAS-induced cardiac dysfunction. There is a higher prevalence of OSA symptoms in an asthmatic population (39.5%) when compared to a primary care population (27.2%).²² Interestingly, in comparison to our study prevalence of asthma in OSAS patients is much lower than international standards at 17.2%. Justification of this may be due to diagnosis of sleep apnea masking asthma diagnosis. Also, COPD may be over diagnosed instead of asthma as both are overlapping obstructive ventilatory defects.

Negative intrathoracic pressure in OSAS patients have been suggested as the underlying mechanisms of nocturnal gastro-oesophageal reflux diseases (GORD). Obesity is a common factor and a cause of the high prevalence of GORD in OSAS patients.²³ It has also been described that the treatment of OSAS with nasal CPAP helps in improving nocturnal GORD and decreases the frequency of symptoms by 48%. There is greater improvement in GORD expected with higher nasal CPAP.²⁴ As we know, there is a high frequency of nocturnal arousals, movements and reflux symptoms in OSAS patients. Nasal CPAP corrects negative intrathoracic pressure which corrects these predisposing factors and reduces nocturnal GORD symptoms.²⁵

Despite the large number of cross-sectional or case-controlled epidemiological studies, the issue of whether OSAS independently increases the risk of mentioned systemic diseases have been contentious. The development of sophisticated animal models will be required to explore pathophysiological mechanisms, and the

collaboration of respiratory, cardiovascular, epidemiological, and clinical trials experts to examine the clinical consequences of diagnosing and treating sleep apnoea. In conclusion, the diagnosis and treatment of sleep-related breathing disorders can improve health outcomes in patients suffering from or at risk for cardiovascular, metabolic, endocrinological, gastroenterological and respiratory diseases.

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Laboratory Test Costs: Attitudes and Awareness Among Staff in a Regional Hospital

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Abstract

There continues to be an unrelenting rise in the volumes of laboratory tests ordered in medicine, which is both expensive and has the potential for over-investigation. We performed a quantitative, observational, cross-sectional study of staff with the authority to initiate a laboratory test, using a voluntary, anonymous questionnaire. Our aim was to assess the awareness of and attitudes towards laboratory test costs. 226 surveys were completed over 2 weeks in June, 2012. Most numerous respondents were Staff nurses 125 (55.3%) followed by senior house officers (SHOs) 26 (11.5%) and clinical nurse managers/ specialists (CNMs and CNSs) 23 (10.2%). The majority of staff, 191 (85.6%), felt unaware of the cost of laboratory tests, which they ordered. For non urgent tests, the majority of respondents, 136 (61.8%) felt cost was either quite or very important. For urgent tests, the majority of respondents, 188 (84.6%) felt cost was of minor or of no importance. Doctors felt more aware of costs than nurses (26.9% vs. 9.3%) and doctors test cost estimates were correct more often than nurses (33% vs. 21%). The results indicate poor awareness of laboratory test cost amongst doctors and nurses. Given the expenditure incurred by a rise in the volume of tests and the potential for over-investigation for patients, strategies for improving the awareness of and attitudes towards laboratory tests need to be developed.

Introduction

Laboratory testing, as part of overall hospital budgets has been on an unrelenting rise for decades, relative to patient visits.¹⁻³ Diagnostic tests represent 3% of annual cost of health care worldwide.⁴ Doctors control as much as 80% of laboratory costs through ordering.⁵ Reasons for overutilization have been much studied with numerous reasons such as “defensive testing”⁶ fear or uncertainty, lack of experience, inadequate educational feedback, the use of clinical protocols and guidelines, “routine” clinical practice and clinicians unawareness about the cost of examinations.⁷ Independent factors for over utilization of tests were patient age >65, hospitalisation beyond 7 days and increased case difficulty.⁸ A previous small study of doctors in Ireland showed less than a quarter could accurately estimate the cost of laboratory tests.⁹ In times of limited resources for health care, it is imperative to evaluate ways to manage overutilization of laboratory tests and in turn provide cost effective practice and quality care to our patients.

Methods

We set about assessing the awareness of and attitudes towards laboratory test costs among staff in Sligo Regional Hospital (SRH) in June 2012. An 8-question survey was designed, piloted and made available in all clinical and non-clinical areas of the hospital for a two-week period. The survey and the questions asked are shown in Figure 1. Inclusion criteria for participation were those staff with authority to order a laboratory test in the hospital. Staff not authorised to instigate tests were excluded. Emails and verbal ward reminders made staff aware of the survey. Questionnaires were voluntary, confidential and anonymous.

Question 7 asked respondents to estimate the cost of laboratory tests. This cost was for routine daytime batched tests. This included scientific staff, lab clerical staff, portering, tubes, forms, water purification and reagents. Estimation was deemed correct if the qualitative band where the actual cost lay, was selected. If the option(s) above or below the correct band were selected, this was deemed to be an over or under estimation, respectively. Respondents deposited completed questionnaires in secure collection boxes, available through out the hospital. Results were collated on Microsoft Excel® and analysed using SPSS (v15.0). Sligo Regional Hospital Research Ethics Committee granted ethical approval.

Figure 1 Research Questionnaire

Results

Respondent Demographics

226 surveys were completed and collected over 2 weeks in June, 2012. Staff nurses were the most numerous respondents 125 (55.3%) followed by senior house officers (SHOs) 26 (11.5%), clinical nurse managers/specialists (CNMs and CNSs) 23

(10.2%), registrars 15 (6.6%), consultants 14(6.2%), student nurses 12 (5.3%), interns 7 (3.1%) and specialist registrars (SpRs) 2 (0.9%). The representation of total whole time equivalents (WTEs) for the hospital was interns 64%, SHOs 57%, registrars 37%, CNMs/CNSs 32%, Staff nurses 29%, SpRs 25%, consultants 24%. WTE student nurse data was not available. Medicine was the most common specialty represented 72 (32%), followed by Paediatrics 30 (13%), Obstetrics & Gynaecology 23 (10%), Surgery 20 (8.8%), Emergency Department 19 (8.4%), Orthopaedics 17 (7.5%), Day Ward 13 (5.7%), Out Patients 9 (3.9%), Acute Assessment Unit 6 (2.6%), Intensive Care 5 (2.2%), Eyes, Ears, Nose and Throat Ward 2 (0.9%). 10 (4.4%) missing values.

Frequency of Laboratory Ordering

6 interns (85.7%) and 17 SHOs (65.4%) ordered >6 tests per day. These two roles were the most numerous for large ordering volumes. 11 Student nurses (91.7%), 19 CNM/CNS (82.6%), 100 staff nurses (81.3%), 12 registrars (80%), 8 consultants (57.1%) and 1 SpR (50%) ordered <6 tests per day. These roles were the most numerous for low ordering volumes.

Attitudes towards cost of non-urgent laboratory tests

Those respondents who, in the majority, felt non-urgent test cost were of 'minor' or 'no importance' were 7 student nurses (63.6%) and 4 interns (57.1%). Those respondents who, in the majority, felt non-urgent test cost were 'quite' or 'very important' were 2SpRs (100%), 12 registrars (85.7%), 11 consultants (78.5%), 15 CNM/CNSs (65.2%), 16 SHOs (61.5%) and 73 staff nurses (59.3%). 6 missing values.

Attitudes towards cost of urgent laboratory tests

The majority of every group of respondents felt cost of urgent tests was 'of minor' or 'no importance'. 12 student nurses (100%), 26SHOs (100%), 7 interns (100%), 21 CNM/CNSs (91.3%), 100 staff nurses (81.3%), 11 registrars (73.3%), 10 consultants (71.4%) and 1 SpR (50%). 4 missing values.

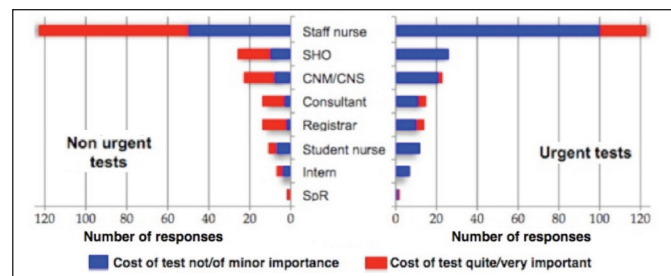


Figure 2 Attitudes of all hospital staff towards the cost of both urgent and non-urgent laboratory tests

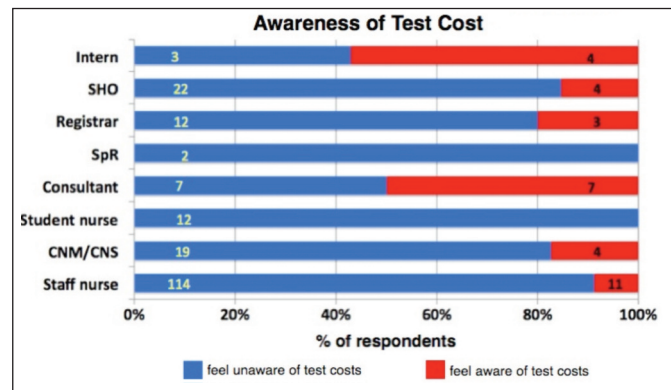


Figure 3 Awareness of test cost among hospital staff

Awareness of laboratory cost

The majority in each role category, except interns, felt unaware of the costs of the tests they ordered. 12 student nurses (100%), 2SpRs (100%), 114 staff nurses (91.2%), 22 SHOs (84.6%), 19 CNM/CNSs (82.6%), 12registrars (80%) and 7 consultants (50%) felt they were unaware of laboratory test costs. 3 interns

(42.9%) felt unaware of cost of tests generally. When grouped, 145 (90.6%) nurses compared with 46 doctors (73%) felt unaware of cost.

Estimation of laboratory cost

In total, there were 4025 estimations of cost, spread over 19 regularly ordered tests. 1046 (26%) of costs estimated were correct, 2107 (52%) were underestimated and 715 (18%) were over estimated. For 157 (3.9%) of estimates, 'Not applicable to me' were selected. It was not possible to over estimate 5 of the tests as the irrespective cost fell in the highest cost range (blood culture, Group and screen, Vitamin D, Vitamin B12& folate and Thyroid function tests). Over the 19 tests, those in senior roles (consultant, CNMs/CNSs, SpRs, registrars, n=54) correctly estimated cost 25.4% (range 9.3% -42.6%). This was very similar to more junior grades (staff nurses, SHOs, interns and student nurses where n=170) who estimated cost correctly 23.9% (range 15.3% - 36.5%) of the time. If grouped by role, nurses estimated cost correctly 20.1% of the time (range 1.9% - 35%). 33.4% of doctors estimates of test costs were correct (range 20.3% - 53.1%).

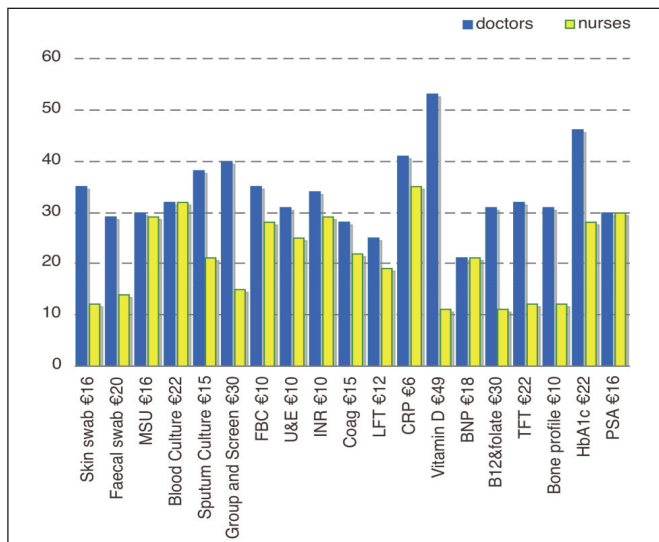


Figure 4 % of estimated costs which were correct among Doctors and Nurses

Discussion

We established that the majority of both doctors and nurses felt unaware of the costs of laboratory testing. Overall they were twice as likely to underestimate than over-estimate costs. Seniority of role did not appear to improve ability to estimate the test costs correctly. In fact, with 4 ranges of cost to choose from, the results would suggest random chance i.e. 25% correct. The SRH laboratory budget is €12 million, approximately 10% of the total hospital budget. A reduction in the amount of laboratory tests ordered could have a significant impact on cost savings. An increasing wealth of medical literature has highlighted the recent trend of over-diagnosis, over-investigation and over-treatment of our patients.¹⁰ Excessive laboratory testing is one element of this process. It can only stand to protect patients that appropriate utilisation of laboratory testing be encouraged.

Much research has centered on ways to improve appropriate utilisation of laboratory testing. On the whole, results have been varied and positive effects of interventions tend to wane over time.¹¹ While the Hawthorne effect may account for some of these observations, some interventions show promise. Firstly, informing those who order of the actual cost can have the effect of improving appropriate utilization.^{12,13} A study of a paediatric emergency department demonstrated evidence that by displaying price information to those ordering, laboratory utilisation was reduced for the period of observation. More senior doctors showed a smaller decrease in their ordering. The effect waned after the intervention perhaps emphasising the need for reinforcement. Patient outcomes and satisfaction were not

affected by the intervention.¹³ Secondly, providing feedback has shown promise in improving over-utilisation of laboratory costs.

One small study of 56 doctors showed that providing a manual on tests and feedback, was superior to control (feedback alone).¹⁴ A further paper looked at improving physicians understanding of appropriate test selection and improving display of results as tools for cost effective medicine.¹⁵ Feedback provided by laboratory staff to high volume ordering physicians produced a significant 8% reduction in laboratory test orders.¹⁶ This study was community based but could work easily in a hospital environment. Another large Australian study found education feedback reduced avoidable tests being ordered but this effect waned after the intervention was completed.⁸ Feedback could take the form of senior chart review at educational meetings or during one-to-one ward round based teaching. High value, cost-conscious care could be fostered in this way. As a guide to this concept, a 2012 paper developed the idea of high value care, where benefits outweigh the sum of costs plus harm.¹⁷ As demonstrated in our survey, interns and SHOs order the largest volume of tests and hence, this form of feedback could have a significant impact on reducing laboratory overutilization.

Thirdly, some administrative interventions have an immediate effect on reducing over-utilisation. An Israeli uncontrolled administrative intervention reduced availability of emergency tests and curtailed repeat testing frequency. Educational measures, a new restrictive policy of laboratory testing and feedback formed part of the intervention.¹⁸ In our hospital, on-call and emergency testing have been curtailed for some time. There is scope for the introduction of minimum intervals between repeat tests. This has been studied and showed that automated test rejection based on predefined limits for repeat ordering, had a beneficial effect on physicians ordering behaviour and contributed towards health care savings.¹⁹ Finally, multifaceted interventions for promoting efficient laboratory use have been studied. An intensive multifaceted, hospital-based intervention in the Netherlands produced a 13% reduction in total diagnostic costs. The intervention involved posters, pocket cards, mentorship of juniors, unbundling of tests and increased protocol adherence.²⁰ However, a 2004 Dutch randomized control study showed that implementing an intensive feedback and guideline education intervention was not cost effective if cost of physicians' time was included. Feedback alone was preferable from a cost point of view.²¹ The authors note the recent NHS reforms, which impart financial responsibility of service utilisation in primary care, such as laboratory testing, on Clinical Commissioning Groups, marrying the responsibility for the ordering of investigations with the cost involved.^{22,23} One would wonder if a similar system could be utilised by hospital trusts or at a local level by Clinical Directors, to ensure sustainable utilisation of resources.

In conclusion, our study is, to our knowledge, the first to assess the awareness and attitudes towards laboratory test costs among Irish healthcare professionals. Among the staff, we demonstrated a low awareness of costs, a propensity to underestimate costs and a reduced cost sensitivity in urgent testing. There are many evidence-based approaches that could be implemented to reduce laboratory over-utilisation. Price information has a transient beneficial effect. Senior chart review and laboratory staff feedback, if reinforced, are likely to produce positive sustained effects towards reducing over-utilisation. This could be incorporated into educational meetings and one-to-one educational opportunities. Administrative interventions, in particular minimum interval for repeat testing, would be advantageous. We did not investigate GPs attitudes and knowledge of laboratory costs, but this is an area, which we feel also merits further study.

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Organ Donation Following the Circulatory Determination of Death (DCD): An Audit of Donation and Outcomes Following Renal Transplantation

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Abstract

Organ Donation following the Circulatory determination of Death was introduced in Beaumont Hospital during 2011. The Intensive Care Society of Ireland formally endorsed a national DCD clinical practice guideline in 2012. This retrospective audit covers a 2-year period during which eleven patients were considered suitable for DCD and where consent was obtained. Nine patients died within the ninety-minute period following the withdrawal of life sustaining therapies and subsequently donated organs (82%). Eighteen kidneys were recovered and seventeen patients received renal transplants - one patient received a nephron-dosing dual renal transplant. Lungs were recovered on two occasions and one patient received a lung transplant. Heart valves were recovered on one occasion. To date sixteen of seventeen recipient patients have functioning renal transplants (94%). In conclusion, this model of deceased donation has proven acceptable to families, nursing and medical staff and the outcomes reported are consistent with international best practice.

Introduction

Donation after the Circulatory Determination of Death, Donation after Circulatory Death and Non Heart Beating Organ Donation (DCDD, DCD, NHBD) are synonymous terms. They refer to the process whereby organs for transplantation are recovered from a person whose death has been diagnosed on the basis of cardio-respiratory criteria. This is distinct from Donation after Brainstem Death (DBD). Potential DCD donors may be divided into five categories. Category I patients are pronounced dead on arrival to hospital. Categories II and V are patients in whom resuscitation has been attempted, but are pronounced dead following either

out-of-hospital cardiac arrest (category II), or in-hospital cardiac arrest (category V). Category III patients have devastating neurological injury, withdrawal of life-sustaining therapy (WLT) is anticipated and end of life care planned. Category IV are patients who suffer cardiac arrest during or after brainstem testing. In these patients BSD testing may prove impossible due to haemodynamic instability or impending cardiovascular collapse.¹

DCD is necessary for a number of reasons; Ireland has had an extremely successful transplantation program, however organ donation rates fluctuate. Within the Council of European

Countries, the Republic of Ireland's organ donation rates moved from 6th in 2006 to 22nd in 2010 (13 organ donors per million population – pmp). Though rates improved markedly in 2011 (20 pmp), a comparison with Spanish figures (34 pmp) places this improvement in context.² DCD is necessary because BSD is being diagnosed less frequently. Road deaths have decreased by greater than 50% within the past 14 years, a statistic known to correlate closely with organ donation rates.^{3,4} Organ donor patients who have died as a result of trauma from any cause are decreasing, from 44% (2000-2005) to 33% (2006-2011).⁵ Finally advances in neurocritical care such as the endovascular management of subarachnoid haemorrhage and decompressive craniectomy have also decreased the numbers of patients who progress to BSD.^{6,7}

The most important reason that DCD is necessary is that patients who have expressed a wish to become an organ donor during life, may be denied this end-of-life care-pathway. This occurs if neurological death cannot be confirmed, although, following WLT they may rapidly progress to cardiac arrest and consequent BSD. When death is diagnosed by cardio-circulatory criteria there is still an opportunity to donate organs. The lack of a widely accepted clinical practice guideline dedicated to DCD has heretofore precluded this possibility and denied these patients and families their wish to donate. The DCD practice guideline upon which these results are based, has been reviewed extensively and approved by learned groups both locally and nationally.⁸ The reintroduction of DCD with significant restrictions is an important step nationally. DCD accounted for 42% of cadaveric organs donated in the United Kingdom during 2012.⁹

Some caution the development of DCD will further decrease the number of patients who donate organs after BSD. Might some clinicians default to DCD rather than waiting for BSD to occur or might some clinicians use a DCD pathway to avoid BSD testing? – this is known as “substitution”. Although a legitimate concern, it appears unfounded. BSD donor numbers had been falling in several countries in the years before many DCD programs were introduced.¹⁰ It would be a disservice to transplantation to discontinue life-sustaining therapies early and submit a patient to DCD where extra time would see BSD criteria fulfilled. Although long-term renal outcomes are equivalent, the incidence of delayed renal graft function is increased with DCD. In hepatic transplantation, vascular and biliary complications are increased with DCD. While the evidence suggests that lungs function equally well following DCD, heart transplantation, although reported in the literature and historically, is rare.¹¹ Finally, the number of organs retrieved following BSD is greater than following DCD (3.6 vs 2.1 and 3.3 vs 2.5).¹²

The objectives of this paper are to present the organ donor data and to detail the disease processes that led to these patients being considered for DCD. Early and intermediate results of the transplant recipients are presented.

Methods

This retrospective analysis is based on chart reviews, electronic notes, radiological imaging and test results. The anonymised data presented are regarded as audit and service evaluation rather than research and, following consultation, ethics approval was not deemed necessary. Patients came from two level-3 intensive care units in two hospitals. Beaumont hospital is one of two national neurological tertiary referral centres. The data from eleven potential organ donor patients and seventeen renal transplant recipients were reviewed and simple descriptive statistics compiled.

Results

Donors

Eleven patients (M:F - 8:3) completed the DCD protocol (Table 1). Two patients were in Maastricht category IV. Brainstem testing could not be performed in one patient because the patient was in a state of cardiovascular collapse. Milligram rather than microgram quantities of inotropes were required to maintain a systolic blood pressure of 70 mmHg. While BSD had been diagnosed in the second patient, cardiac arrest ensued despite aggressive resuscitation. Both patients subsequently donated organs. Nine patients were in Maastricht category III. Two of these nine patients did not die within the time period of 90 minutes from WLT and neither patient donated organs as a result. This resulted in the donation of 18 kidneys, lungs on two occasions and a single set of heart valves. All kidneys were transplanted. One patient received a lung transplant and on the other occasion the lungs were not transplanted due to poor performance on the ex-vivo circuit (extracorporeal circuit where lungs are assessed).

Recipients

Each organ for transplant was biopsied and placed on the hypothermic machine perfusion (HMP) circuit to determine flow and resistance indices. Each of the eighteen kidneys were transplanted into seventeen patients (M:F – 11:6) (Table 2). One patient had a nephron-dosing transplant, i.e. both donor kidneys were transplanted into a single recipient.

Transplantation was unsuccessful in one patient, biopsy data suggested a recurrence of the patient's primary condition – focal segmental glomerulosclerosis. The patient did not respond to plasmapheresis and a transplant nephrectomy was performed. A second patient had prolonged delayed graft dysfunction (DGF), while biopsy data and nuclear imaging studies were satisfactory, doppler studies demonstrated renal arterial stenosis. This patient's renal function recovered following angioplasty of the arterial anastomosis, creatinine values decreased from 500 to < 200 micromoles liter⁻¹. Five patients had immediate graft function and did not require post-transplant dialysis. The other ten patients required 32 post-transplant dialysis sessions in total, before all were free from dialysis. This equates to a DGF rate of 70%. As expected, creatinine levels continued to decrease following hospital discharge to a plateau value between 70 and 90 days post transplantation.

Discussion

This case series of eleven contains two patients in the Maastricht IV category. In the patient who did not arrest, BSD could not have been established by cerebral angiography. The absence of intra-cerebral flow could merely reflect hypotension rather than brain death.

In the Maastricht III category, three patients suffered hypoxic ischemic encephalopathy (HIE) as a result of cardiac arrest. Two

Table 1 Organ Donor Patients

Code	LOHS	Age	Diagnosis	Comorbidities	Creatinine Admission (donation)	Inotropes	FiO2	DI	BMI	WLT - Death (mins)
Maastricht Category IV: Donation during or following diagnosis of Brainstem Death										
A	1	45-55	SAH H&H V	C2H5OH	133 (157)	Vaso + NA + Adr	100%	Yes	H	8
B	4	35-45	ICH	BP +++	93 (323)	Vaso + NA + Adr	100%	Yes	N	Post BSD
Maastricht Category III: Following withdrawal of life sustaining therapy										
C	3	45-55	TBI	C2H5OH	53	Low Dose	30%	No	H	30
D	4	45-55	HIE	Nil	43	Nil	30%	No	N	23
E	3	35-45	TBI	C2H5OH	82	Vaso +NA +Adr	90%	Yes	N	30
F	3	35-45	TBI (OOHCA)	Nil	Normal	Low Dose	40%	No	N	45
G	6	55-65	HIE (OOHCA)	Nil	164 (115)	Low Dose	30%	No	N	28
H	14	55-65	TBI	Epilepsy	56	Nil	30%	No	N	40
I	12	55-65	SAH	Depression	59	High dose NA	30%	No	N	45
Maastricht Category III: Prolonged time from WLT to death										
J	6	45-55	HIE (OOHCA)	Nil	110	Nil	50%	No	H	93
K	4	55-65	TBI	Nil	N	Nil	30%	No	N	150

LOHS: Length of hospital stay, SAH: Subarachnoid Haemorrhage, H&H : Hunt and Hess grade of SAH, ICH: Intracranial Haemorrhage, TBI: Traumatic Brain Injury, HIE: Hypoxic Ischaemic Encephalopathy, OOHCA: Out of Hospital Cardiac Arrest, DI: Diabetes Insipidus, BMI: Body Mass Index, Vaso: Vasopressin, NA: Noradrenaline, Adr: Adrenaline. BMI: Body Mass index H: increased N: Normal

Table 2 Recipients

Code	Age	WIT (minutes)	CIT (hours)	LOHS (days)	Creatinine (Hospital Discharge)	Creatinine (months post Transplant)
1	45-55	45	18	10	186	154 (2)
2	55-65	45	15	10	252	174 (2)
3	65-75	30	17	20	265	185 (2)
4	20-45	40	11	19	339	126 (5)
5	55-65	40	16	26	370	167 (5)
6	55-65	28	14	13	224	98 (1)
7	55-65	28	18	14	219	115 (2)
8	45-55	24 ++	18	13	835	199 (2)
9	55-65	24 ++	22	14	502	198 (9) DGF +++ Angioplasty
10	65-75	45	17	14	306	108 (1)
11	55-65	45	18	14	258	109 (2)
12	45-55	30	13	16	325	115 (5)
13	20-45	30	18	22	375	130 (6)
14	65-75	16 ++	18	18	270	111 (12)
15	65-75	16 ++	20	19	260	129 (9)
16	65-75	38	18	19	260	62 (12)
17	65-75	38	21	19	PNF Graft Recurrence Explanted	

WIT: Warm Ischemic time – Time from SpO₂ < 40% or systolic blood pressure < 40mmHg to cold perfusion, CIT: Cold Ischaemic time – Time from cold perfusion to reperfusion of graft in the recipient, LOHS: length of hospital stay. Creatinine: Micromoles L⁻¹

patients had status epilepticus despite multiple antiepileptic medications. In both, seizure activity on the EEG was temporarily suppressed by boluses of thiopentone (a potent intravenous anaesthetic and anticonvulsant). The third patient exhibited myoclonus on stimulation and an EEG suggesting severe HIE. These patients spent four, six and six days respectively in hospital undergoing neurological evaluation before therapies were redirected to end of life care. None of these patients would have progressed to BSD. The other six patients within the Maastricht III category suffered traumatic brain injury (TBI) or subarachnoid haemorrhage (SAH), but did not progress to brain death. Radiological imaging of each patient was consistent with devastating injury. Two patients had herniation of brain tissue through a craniotomy. Two patients had fixed and dilated pupils for more than 48 hours. Again each patient was observed for a significant period following the injury: three patients for three days, one patient for four days, one patient for twelve days and one patient for fourteen days. Families require time with their loved ones, and while some may be supportive of organ donation, requesting additional time to determine if BSD will occur may be untenable. Families may wish for some degree of certainty in terminal events such as the timing of withdrawal of life supporting therapies.

Although our data demonstrate that outcomes from recipients are very good, we observed a significant incidence of DGF. DGF is defined as the need for dialysis within the first seven days post transplantation. Though the rate of DGF in this case series is 70% and higher than that reported by others, the presence of DGF does not adversely affect the longer-term viability of these kidneys.^{13,14} An average of 2 post transplant dialysis treatments per patient was required, and length of hospital stay increased by 4 days. Recent guidelines from the UK suggest that renal transplant outcomes are satisfactory when the warm ischaemic time (WIT) is increased to 120 minutes and up to 240 minutes in selected individuals. The maximum allowable WIT should be no more than 30 minutes for liver and pancreas retrieval and 60 minutes for lungs. The lungs are unique in their ability to withstand the deleterious effects of the WIT as oxygenation is accomplished by local gaseous diffusion.²

DCD has not yet realised its full potential; the WIT is unlikely to change, but ischemia reperfusion injury may be reduced by minimising the cold ischaemic time. While transplant surgeons are reassured by the direct observation of the perfused organ in-vivo as occurs in donation after BSD, this opportunity is invariably lost in DCD. Other assessments however, such as macroscopic appearance, biopsy data and flow and resistance measurements on HMP can provide crucial information. Biochemical markers

have been identified which correlate with adverse clinical outcomes and primary non-function in hepatic transplantation.¹⁵ By using these markers, inferior hepatic grafts may be discarded early. A number of normothermic ex-vivo oxygenation machines are undergoing trials at present, these afford the opportunity to observe urine production in kidneys, bile production in livers and to observe a restarted DCD heart.¹⁶⁻¹⁸ Ex-vivo normothermic lung perfusion is widely practised and supported by considerable evidence.¹⁹ The General Medical Council (UK) state in their publication "Treatment and care towards the end of life - Guidance for Doctors (2010)" that "if a patient is close to death and their views cannot be determined you should be prepared to explore with those close to them whether they had expressed any views about organ or tissue donation", and furthermore "you should follow any national procedures for identifying potential organ donors and in appropriate cases notify the local transplant coordinator".²⁰ Organ donation should be considered a part of end of life care and the possibility always considered.²

Careful planning will ensure the successful implementation of DCD in any hospital. The presence of a locally accepted policy governing the process, a period of staff education and a clear path of audit and governance are essential. In our hospital DCD has been incorporated into ongoing education, "after event reviews" allow staff the opportunity to voice concerns and will improve sustainability over time. This case series is limited by its retrospective nature, small size and short follow-up period. In conclusion we present this case series of eleven organ donor patients, and of eighteen transplant recipients thanks to the generosity of these patients.

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Perinatal Treponema Pallidum: Evidence Based Guidelines to Reduce Mother to Child Transmission

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Abstract

Universal antenatal screening for *T. pallidum* is standard in Irish maternity units. The prevalence of adult syphilis has increased in Ireland. We audited the neonatal management of infants exposed to *T. pallidum* in utero. A cross sectional retrospective analysis of all pregnancies with confirmed positive serology for *T. pallidum* from January 2005 to December 2010 was conducted at the National Maternity Hospital, Holles St. Data were analysed using SPSS 14.0. Ethical approval was obtained. There were 55,058 live births during the study period. Fifty-eight women had positive serology and 41 met inclusion criteria. Infant evaluation and follow up was decided by allocation to an evidence based algorithm. Twenty-one infants (51%) were accurately allocated and assessed, 5 (12%) had a partial assessment and the algorithm was incorrectly applied in 15 (36%) of cases. Failure to adhere to evidence based neonatal guidelines is common and undermines efficacy of the screening program.

Introduction

Epidemiological studies indicate an increase in the adult prevalence of syphilis worldwide in the last decade.^{1,2} In Ireland enhanced surveillance for syphilis has been in place since 2000. A report published by the Health Protection Surveillance Centre (HPSC) in 2008 identified a 50% increase in primary cases between 2007-2008. The majority (77%) of early infections occur in men who have sex with men, however 66% of late infections occurred in women. There was one case of congenital syphilis reported by enhanced surveillance in this time.³ Of 156 cases reported in the last quarter of 2011, 5.8% were diagnosed in antenatal clinics. There was one confirmed case of early syphilis in pregnancy in this last quarter with its associated transmission risk of 77-100%.^{4,5}

The World Health Organisation (WHO), Centre for Disease Control (CDC) and International Union against Sexually Transmitted Infections (IUSTI) all recommend universal as opposed to risk-based screening in pregnant women. In untreated women *T. pallidum* will cross the placenta and cause infection in approximately 66% of cases.⁵⁻⁷ Infection can occur at any time in pregnancy. The likelihood of transmission increases with increasing gestational age, allowing time for screening and treatment. *T. pallidum* is an extremely slowly dividing bacterium. To ensure bactericidal levels of penicillin in the foetus, three doses of benzathine penicillin are administered at weekly intervals. The course should be completed at least four weeks prior to delivery. From the paediatric point of view, clinical and laboratory diagnosis of congenital infection is complex making prevention of mother to child transmission the easiest and most effective diagnostic and treatment strategy for exposed infants. To ensure that transmission has not taken place infants must be followed until clearance of maternal antibodies.⁸ Infected infants are often asymptomatic and undiagnosed congenital infections can manifest as neurodevelopmental delay or musculoskeletal difficulties in childhood.⁹

Methods

This study received ethical approval from the National Maternity Hospital.

Microbiology surveillance data identified all women with confirmed positive serology for *T. pallidum* over a five-year period from 2005 – 2010. Exclusion criteria included mothers who failed to return for delivery, those who booked late and delivered in the absence of serology and pregnancies that ended in miscarriage or neonatal death. A proforma was used to collect data on maternal demographics, history of maternal diagnosis and treatment, perinatal history, infant evaluation and follow up. The adequacy of infant evaluation and follow up was checked against the evidence based algorithm¹⁰ (Figure 1).

The postnatal management algorithm for Irish infants was developed by the paediatric infectious diseases team at the Rainbow Clinic, Our Lady's Children's Hospital¹⁰ (Figure 1). It is in line with CDC recommendations.¹¹ A combination of treponemal specific serology (IgG and IgM) and non-treponemal tests (RPR) are used to diagnose and assess infection status in pregnant women. Those who have not been treated previously, who have inadequate documentation of prior treatment or received suboptimal regimens are referred to genitourinary medicine clinics. Poor compliance with multiple painful outpatient IM injections is a recognised cause of treatment failure and leads to the recommendation that treatment documentation must be reviewed when assessing infant risk.⁶

At birth the paediatrician reviews the mother's serology and treatment history in order to categorise the infant's risk and accurately assign them to the appropriate treatment according to the neonatal algorithm¹⁰ (Figure 1). An infant can only be classified as uninfected once maternal antibodies have cleared which may require follow up until 1 year. The perinatal algorithm has a low threshold for initiation for treatment and is recognised to have the potential for over treatment and investigation of

asymptomatic infants.⁶ This reflects the limited capacity of available testing strategies in definitively excluding perinatal infection in the newborn period and the natural tenacity of the organism. The algorithm also takes into account the problem of reliable patient follow up in what is recognised as a marginalised population. Documented communication difficulty requiring an interpreter was a specific variable. Data were inputted into a password protected Excel database. Basic statistical analysis was carried out using SPSS 14.0.

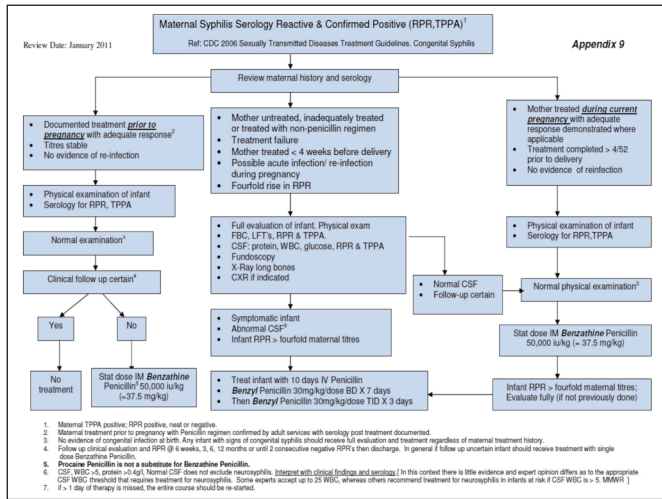


Figure 1 Investigation and Treatment Algorithm for infants exposed to *T.pallidum* in the perinatal period. (The Rainbow Clinic Guidelines 10)

Results

There were a total of 55,058 alive births during the study period. All women were routinely screened at the time of booking and 58 women had confirmed positive serology for *T. pallidum*. The current screening test is an enzyme immunoassay (EIA) for *T. pallidum* IgG. If positive additional confirmatory tests are performed: EIA for *T. pallidum* IgM, rapid plasma regain (RPR) and *T. pallidum* particle agglutination (TPPA). Seventeen pregnancies were excluded from this analysis for the following reasons; 11 did not return for delivery, 4 pregnancies ended in miscarriage, 1 in neonatal death and 1 mother delivered without serology. Forty-one pregnancies were included in the analysis. The incidence of positive serology was relatively static across the time period audited.

The average maternal age was 35+/- 4.7 years. The majority of births were term infants with a mean gestational age of 39.3 +/- 1.7 weeks and a mean birth weight of 3400+/-500gms. 85.4% of infants were delivered by spontaneous vaginal delivery. 95.6% of study patients were first generation immigrants. There was documented communication difficulty requiring an interpreter in 5 cases (14.6%). Twenty-three women qualified for treatment in their current pregnancy. Thirteen who received their first diagnosis of syphilis and 10 women with a prior diagnosis were retreated in

	Mother prior treatment	Mother untreated	Mother treated current pregnancy
Infants (n)	16	10	15
Algorithm correct	6	3	12
Partial algorithm	1	3	1
No Algorithm	9	4	2
Lost to follow up	9	7	5

Mother prior treatment: documented appropriate treatment prior to conception. **Mother untreated:** no / inappropriate treatment or no documentation available. **Algorithm correct:** Number of infants in who were correctly allocated within the algorithm based on assessment of maternal serology and treatment. **Partial algorithm:** infants correctly allocated but management plan not completed as per algorithm. **No algorithm:** alternative plan decided by attending paediatrician. **Lost to follow up:** infants did not have documented serological clearance.

the current pregnancy due to incomplete documentation of previous treatment (n=7), treatment with an inappropriate regimen (n=2) or serological evidence of recent i.e. recurrent infection (n=1). 15 women in total were referred for treatment.

Infants were allocated to the management arms of the algorithm based on assessment of the mother's treatment history, serological evidence of infection and the potential for maternal re-infection in pregnancy, which may be suggested, by a co-infected partner or high risk sexual behaviour. It may also be evident from the results of quantitative serology (Figure 1). Infants whose mothers received treatment in the current pregnancy were more likely to complete investigations as planned (12/15) compared to those whose mothers had received treatment in previous pregnancies (6/16) and those whose mothers were untreated (3/10). Infants across all groups were equally likely to be lost to follow up (Table 1). 21 infants were lost to follow up, 3 of who did not return for their appointment, parents refused further tests in 2 cases. In 16 cases return appointments were not arranged although indicated by the algorithm.

Discussion

This study confirms that adherence to the recommended guidelines for follow up of neonates exposed to *T. pallidum* in utero needs ongoing compliance audit at this institution. The group of infants most likely to have complete follow up were those born to mothers treated in the current pregnancy (Table 1). This may be due to their enhanced contact with antenatal services. In a low prevalence state, positive screening serology reflects latent infection in the majority of cases. It is accepted that the algorithm may lead to over investigation of infants however there is a strong evidence base for its implementation. Improved education of paediatricians working in maternity settings as to the basis for such recommendations may improve compliance and improve infant follow up.

Five infants required a full assessment including lumbar puncture as their mothers were not treated within four weeks of their delivery. All these infants were born at term and their mothers diagnosed at booking. Information was not sought on booking gestation however in general there should be adequate time for diagnosis and effective treatment. Referral to offsite genitourinary medicine clinics may delay this process. On two occasions mothers stated they had completed treatment however no documentation was available. The absence of this documentation led to inappropriate or delayed investigation of infants. The CDC guidelines suggest that all women treated in pregnancy should be given a treatment card with dates and details of therapy to circumvent administrative delays.¹¹

Immigrant populations may not engage as effectively with health services for a variety of reasons. They may not be settled in one area and there may be barriers to effective communication. In this study 11 pregnancies were not included in the analysis, as the mothers did not return for delivery. There was documented communication difficulty requiring an interpreter in five cases. We have no information on the level of communication or understanding in other cases and to what extent this might have led to incomplete assessment of infants. Migrant health is an as yet undeveloped speciality in Ireland and the onus is on all of us to advocate for patients who may not be accessing necessary services. Poor compliance with the algorithm is particularly worrying in high risk populations where re-infection after initial screening is of concern. International research confirms the important contribution of *T. pallidum* to pregnancy loss.⁶ There were four miscarriages of undocumented aetiology in infected mothers. These foetuses were not tested for congenital infection. In the cases of the neonatal death in an exposed infant *T. pallidum* status was not ascertained. *T. pallidum* should be considered as a potential aetiological agent for pregnancy loss and neonatal death in exposed infants in order to fully quantify the disease burden in pregnancy.

In 1988 the CDC published a list of barriers to the comprehensive prenatal care necessary to prevent congenital syphilis. These included population factors such as poverty, education level and health care access, communication difficulties, the lack of readily accessible and acceptable treatment strategies, poor organisation of services and lack of understanding among patients of the need for treatment.¹¹ All of these barriers were identified in our population two decades on. Local audit should be encouraged to assess compliance in individual maternity units nationwide and identify barriers. Based on this audit we would recommend increased education for neonatal and midwifery staff on the evidence based algorithm. Ideally, dedicated staff is necessary to follow pregnancies from diagnosis to infant discharge, where this is not practical enhanced documentation strategies such as chart inserts with detailed perinatal and follow up care plans should be devised. Communication of the importance of follow up should be ensured with an interpreter.

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Acknowledgements

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Diversity in Prevalent PCR Ribotypes of Clinical Strains of *C. difficile*

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Abstract

In 2009, a programme of *Clostridium difficile* ribotyping was established in the north east. The aim of this project was to profile circulating ribotypes in the region. In all, 50 notified north east *Clostridium difficile* cases were ribotyped. The majority of cases occurred in patients over 70 years and in hospital in-patients. The most common ribotype identified was O27 (n=12, 24%) and O05 (n=8, 16%). Ribotype O78 was also detected (n=5, 10%). Comparison with a 2009 national ribotyping study demonstrated that there were a number of ribotypes identified in the north east that were not identified during the national study and visa versa. The results of this study point to the existence of regional variation in circulating *Clostridium difficile* strains in Ireland. A reference facility for Ireland is urgently required to provide a central point for enhanced testing and epidemiological analysis of national and regional *Clostridium difficile* trends.

Introduction

Clostridium difficile is a gram positive, anaerobic spore forming bacillus. The organism can cause a wide spectrum of disease including antibiotic associated diarrhoea or colitis and pseudomembranous colitis with toxic megacolon. Acquisition by vulnerable hospitalised patients has serious implications for both the patient in terms of outcome and the hospital in terms of subsequent transmission to other patients and possibility of outbreaks. In all, 150 different PCR ribotypes and 25 different toxinotypes of *C. difficile* have been described and recently a hypervirulent strain (PCR ribotype O27) which is associated with high morbidity and mortality has also emerged^{1,2}. *Clostridium difficile* associated disease, CDAD, became notifiable in Ireland on 4th May 2008. Between this date and 31st December 2009, 3,538 laboratory confirmed CDAD cases were notified nationally providing a national crude incidence rate of 56.9 per 100,000 population³. The publication of national guidelines on the surveillance, diagnosis and management of CDAD⁴ has also

allowed a greater understanding and response to the problem of CDAD in Ireland.

The Health Protection Surveillance Centre (HPSC), St. Vincent's University Hospital and University College Dublin undertook a one-month national enhanced surveillance, typing and antimicrobial susceptibility study of all cases of CDAD identified in March 2009⁵. Of the 80 new *C. difficile* cases ribotyped during this national study, from 33 Irish healthcare facilities, ribotype O27 (16%) and O16 (14%) were most common. Less than ten *C. difficile* cases occurred in the north east region during the national project. The north east region comprises a population of 440,698 and covers the counties of Cavan, Louth, Meath and Monaghan. The region is served by four laboratories which manage the diagnostic needs of the hospitals and local communities. Therefore, in order to extend the mapping of circulating strains of *C. difficile* in the region, in July 2009, a six month programme of *C. difficile* ribotyping was established with the financial support of the north east regional SARI (Strategy for the Control of

Antimicrobial Resistance in Ireland) committee. The aim of this study was to identify the common strains of *C. difficile* circulating in the north east during the latter half of 2009 and to compare the results to data from the national project.

Methods

In 2009, all four laboratories in the north east performed testing for *C. difficile* toxin on faecal samples using Meridian Immunocard Toxin A&B (Meridian Bioscience Inc.) or Techlab (TECHLAB®, Inc) enzyme immunoassay methodology. Laboratories in the region tested on request for *C. difficile* in patients over two years but culturing of isolates was not routinely performed. A six month surveillance project was established in July 2009. Diarrhoeal samples from the laboratories in the north east region which were found to be toxin positive for *C. difficile* by immunoassay were centralised and dispatched in a monthly shipment to the *C. difficile* Ribotyping Network for England (CDRNE), Microbiology Reference Laboratory, Leeds General Infirmary, UK. Some samples prior to July 2009 which had been stored appropriately were also sent for ribotyping. Only samples that were either toxin positive by immunoassay in the local laboratory or that were toxin positive following cytotoxigenic culture testing by the reference laboratory were included in this study in order to analyse only clinically relevant strains.

Data on all notified cases of acute infectious gastroenteritis (AIG) due to CDAD from the north east region were obtained from the Computerised Infectious Diseases Reporting (CIDR) System. Data on all new *C. difficile* cases from the 2009 national ribotyping study⁵ were used for comparison with the north east study.

Results

Overview

There were 84 *C. difficile* cases notified in the north east region during 2009, 50 of which were ribotyped (Table 1). This represents 60% of all *C. difficile* cases notified in the region for 2009. In all, 18 different ribotypes were identified. The most common ribotype was O27 (n = 12; 24%), followed by O05 (n = 8; 16%), O02 (n = 6, 12%) and O78 (n = 5; 10%). Together, these four ribotypes account for over half (62%) of all the ribotypes identified.

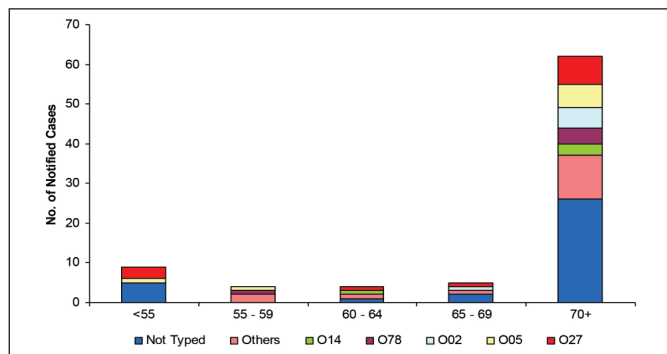


Figure 1 Distribution of north east ribotypes by patient age group

Age Profile

The majority of notified cases were aged 70 years or over (n= 62, 73.8%; Figure 1). A variety of ribotypes were identified from this cohort but the most common ribotypes were O27 and O05 (Figure 1 & Table 1). In patients under 55 years of age (n = 4), only ribotypes O27 or O05 were identified.

Distribution over Time

The distribution of cases by quarter is shown in Figure 2. The months with the largest number of cases was October and November and coincides with an outbreak of *C. difficile* over two of the hospitals in the region. This outbreak was associated with ribotype O27.

Patient Type

The majority of notified *C. difficile* cases were classified as hospital in-patients (n=53, 63%). There were 15 notified cases

Ribotype	North East (Notified Cases)	% of Total (North East Project Notified Cases)	National Project (New Cases)	% of Total (National Project New Cases)
O27	12*	24.0%	17	21.25%
O05	8	16.0%		
O02	6	12.0%	1	1.25%
O78	5	10.0%	10	12.50%
O14	4	8.0%	8	10.00%
106	2	4.0%	15	18.75%
Sporadic	2	4.0%		
122	1	2.0%		
126	1	2.0%		
O15	1	2.0%	2	2.50%
O20	1	2.0%		
O22	1	2.0%		
O23	1	2.0%		
O46	1	2.0%		
O50	1	2.0%	1	1.25%
O56	1	2.0%		
O72	1	2.0%		
O91	1	2.0%		
O44			8	10.00%
O01			9	11.25%
O03			2	2.50%
O81			2	2.50%
120			2	2.50%
O11			0	
O12			1	1.25%
O87			1	1.25%
174			1	1.25%
Total	50	100.00%	80	100.00%

*Includes six O27 outbreak cases. Recurrent cases from the national project were not included.

for which their main residence was recorded in CIDR as a long term care facility (17.8%). Of these 15 *C. difficile* cases, nine were ribotyped. The most common ribotype was O27 (n=3). The other ribotypes identified for these long term care facility residents included 106, 126, O05, O14, O20, O78. The remaining cases were classified with patient type as Not Specified or Other.

Comparison with National 1 month typing project (2009)

Table 1 compares the ribotypes identified from all new cases of *C. difficile* during the 2009 one month national project with the ribotyping results from notified patients during the six month north east project. The most common ribotype identified by both projects was O27, accounting for over 20% of all samples ribotyped in both projects. However, the next most common ribotype in the national project, ribotype 106 accounting for 18.7% of all national samples, was only identified in two cases in the north east accounting for only 4% of all north east cases. In contrast, the second most common ribotype identified in the north east (O05, n=8, 16%) was not identified in the national project. In all, 11 out of 18 (61%) north east ribotypes (O05, Sporadic, 122, 126, O20, O22, O23, O46, O56, O72, O91) were not identified in the national study. In addition, there were eight out of 16 (50%) national ribotypes (O44, O01, O03, O81, 120, O12, O87, 174) which were not identified in the north east over the six months of the north east surveillance project.

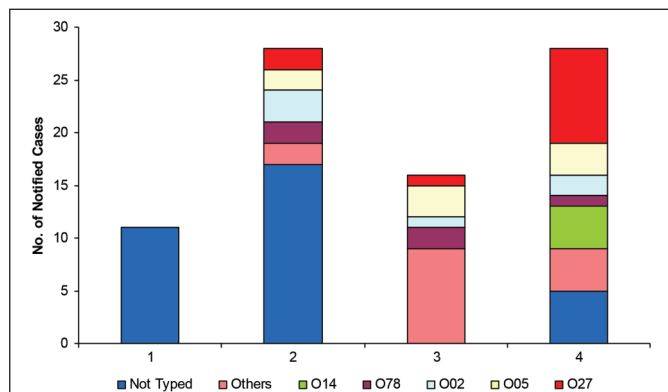


Figure 2 Distribution of north east ribotypes by quarter specimen was collected or received by the laboratory.

Discussion

This study has documented for the first time the diversity of circulating *C. difficile* ribotypes in the north east in 2009. The most common ribotype was found to be the hypervirulent strain, ribotype O27, followed by ribotype O05. In all, 18 different ribotypes were identified over the course of this study, including ribotypes O27 and O78, both of which are associated with increased morbidity and mortality and have been responsible for *C. difficile* outbreaks in the Irish context^{6,7}. Indeed, the ribotype O27 was also found to be associated with an outbreak in the north east region during this study period.

In this study, the most common age for CDAD cases was 70 years and over with the majority of patients classified as hospital inpatients (63%). However, almost 18% of patients had their main residence recorded as a long term care facility and from this group, ribotypes O27 and O78 were also identified. Although patient type or residence does not necessarily ascribe origin of infection, the age profile of these patients would suggest that LTCFs may be important reservoirs of *C. difficile* in Ireland. Clearly, there is potential for interventions in both the hospital and long term care setting (e.g. review of antibiotic stewardship) which may impact on the epidemiology of *C. difficile* and improve elderly patient morbidity and mortality.

It is not surprising that ribotype O27 was found to be the most common ribotype in both the national project and north east project as it appears that this strain is well established in Ireland⁸. The second most common ribotype identified in the national project was only present to a minor extent in the north east. Furthermore, one of the most common ribotypes identified in the north east during the six month study was not identified at all during the national project. These results, combined with other variations in distribution of ribotypes (i.e. 11 north east ribotypes that were not identified in the national project and eight national ribotypes that were not identified in the north east) points to the existence of significant regional variation and possibly an over representation of particular cohorts in the national data. Regional variations in the distribution of ribotypes within a country have been demonstrated in both the UK⁹ and Hungary¹⁰.

There have only been a small number of publications on the prevalence of *C. difficile* PCR ribotypes in Ireland^{1,5-8,11-13}. The majority of these publications relate to ribotyping which resulted from outbreak situations. Until now, systematic ribotyping under non-outbreak periods in Ireland has been limited to the national one month project conducted in March 2009. However, this type of short snapshot favours collection of samples from large facilities with high throughput of patients and may not therefore reflect regional variations. Furthermore, if large scale national studies are to be undertaken in the future, longer time periods for sample collection may need to be considered in order to allow the opportunity to collect a volume of samples that will provide a basis for regional interpretations. The results of this study suggests that ribotyping of *C. difficile* samples is an important exercise and review of guidance at regional level will take cognisance of these findings. It would appear that there is quite a wide diversity of ribotypes circulating in Ireland and both the national and north east project has only provided an initial insight into the true extent of this variation.

During the timeframe of this study, the interpretation of the national guidelines by laboratories in the region meant that specimens were 'tested on request' for *C. difficile*. This testing strategy based on clinical suspicion may have underestimated the overall number of cases and was the main limitation of this study. The national one month study, in a similar manner, only accepted samples from patients with a CDAD diagnosis, therefore, the results of both studies are still comparable. The current national guidelines on the management of *C. difficile* recommend that all diarrheal specimens in patients over two years should be tested for *C. difficile* regardless of request.

Once off studies such as this one and the one month national surveillance project are important in the characterisation of Irish

C. difficile isolates so that regional, national and international comparisons can be made. However, these type of studies cannot substitute for a dedicated *C. difficile* reference facility for the Republic of Ireland. Such a facility would allow rapid identification of circulating strains, would track changes in ribotype distribution and antimicrobial resistance over time and provide a central national point for expertise in the area. It is essential that efforts are made to address this issue in order to combat the challenge of CDAD in Ireland.

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Impact of EWTD on Teaching and Training in Irish Paediatric Medicine: Positive or Negative?

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Abstract

The European working time directive (EWTD) was instituted in Children's University Hospital, Temple Street, Dublin, October 2010. This study aimed to assess the impact of the EWTD on teaching and training in hospital paediatric medicine. Research tools included questionnaire and focus group. Twenty out of a potential 52 non-consultant hospital doctors (NCHDs) completed the questionnaire. Sixty five percent (n=13) of respondents stated the EWTD had an impact on teaching, with 75% (n=15) stating it made it more difficult to attend hospital teaching sessions. The majority (95%, n=19) felt it did not result in increased consultant or registrar teaching time. Thirty five percent (n=7) said the EWTD had decreased consultant supervised training time in specific procedures while 50% (n=10) felt it had reduced registrar supervised training time. The EWTD enabled NCHDs to attend teaching sessions less tired (65%, n=13) but they missed significant teaching due to enforced rest and cross cover arrangements.

Introduction

In the past, long working hours was normal practice for doctors in training, working in hospital, with on call duration extending up to 96 hours over a bank holiday weekend. Both NCHDs^{1,2} and the media³ highlighted their concerns regarding this issue. Fatigue was a common complaint of trainees¹ and many stated they had made errors which they attributed to same⁴. Fatigue impairs human performance^{5,6}. Sleep deprivation has been shown to be equivalent to the effect of alcohol intoxication⁷. In the transportation industry, the extent of working hours has been limited by federal regulations⁸. In particular the aviation industry rules regarding maximal hours in flight have been in place since the 1930s⁹. The EWTD was enacted into the United Kingdom (UK) law as the 1998 Working Time Regulations¹⁰ and was implemented in an incremental fashion. The EWTD was transposed into Irish Law in 2004¹¹. In 2007, the legal obligations regarding compliance with the terms of the EWTD changed such that the average number of hours worked by a NCHD could not exceed 56 hours per week and by August 2009, this figure had reduced to 48 hours. Four years later, inaction and inertia has resulted in multiple paediatric hospitals and departments in Ireland remaining non EWTD compliant. Debate continues about the impact of the EWTD on the delivery of post graduate medical training within the 48 hour week¹².

Methods

A prospective study was performed between January and April 2011, at CUH Ethical approval was obtained from CUH Ethics committee. Research tools employed included both questionnaire and focus group which were completed at the end of a 3 month period working in a EWTD compliant environment. The questionnaire (35 questions) was designed and piloted among the NCHDs. Questionnaire collected both quantitative and qualitative data pertaining to the impact of the EWTD on teaching and training in hospital paediatrics and future recommendations. Data was inserted into excel files, analysed using SPSS version 14.0 and Cronbach's alpha coefficient calculated. Qualitative data from the questionnaire and the focus group was analysed thematically, by the author and verified by a second consultant. The focus group comprised of 2 senior house officers, 2 registrars, an independent observer who transcribed notes and recorded discussion and a facilitator (the author).

Results

Twenty out of a potential 52 NCHDs (not working shift work), completed the questionnaire of which 12 were female (60%). Response rate was 38.4%. Cronbach's alpha co-efficient for the questionnaire was 0.78. The majority (n=18, 90%) were training in paediatric medicine, 2 (10%) were training in general practice while 16 (80%) had > 2years of paediatric training completed. All 20 (100%) had completed at least 3 months working in a EWTD compliant hospital (CUH). Thirteen (65%) respondents agreed the EWTD had an impact on teaching with 15 (75%) stating the EWTD made it more difficult to attend hospital

Table 1 Impact of the E.W.T.D. on teaching in hospital paediatric medicine

		Frequency n	Percentage %
E.W.T.D. has an impact on teaching	Yes	13	65
	No	7	35
E.W.T.D. made it more difficult to attend teaching	Yes	15	75
	No	5	25
E.W.T.D. results in increased consultant led teaching time	Yes	1	5
	No	19	95
E.W.T.D. results in reduced consultant led teaching time with N.C.H.D.s	Yes	11	55
	No	9	45
E.W.T.D. resulted in increase registrar teaching time	Yes	1	5
	No	19	95
E.W.T.D. resulted in reduced registrar teaching time	Yes	13	65
	No	7	35
E.W.T.D. resulted in improved structured teaching programme	Yes	7	35
	No	13	65
E.W.T.D. resulted in trainees being less tired at teaching	Yes	13	65
	No	7	35
Early morning teaching sessions are easier to attend than evening sessions	Yes	16	80
	No	4	20

teaching sessions (Table 1). The majority, 19 (95%) stated it did not result in increased consultant or registrar teaching time, while 11 (55%) stated it actually resulted in reduced consultant and 13 (65%) reduced registrar teaching time. Approximately, two thirds (n=13, 65%) of respondents did not feel the EWTD resulted in the development of an improved structured teaching programme but stated they were less tired at teaching sessions than prior to its introduction, (n=13, 65%). The majority (n=16, 80%) favoured early morning teaching sessions (8-9am).

Table 2 Impact of the E.W.T.D. on supervised training

		Frequency n	Percentage %
E.W.T.D. had an impact on consultant supervised training in specific procedures	Yes	7	35
	No	13	65
E.W.T.D. has decreased consultant supervised training time	Yes	0	0
	No	20	100
E.W.T.D. has decreased consultant supervised training time	Yes	7	35
	No	13	65
E.W.T.D. had an impact on registrar supervised training	Yes	8	40
	No	12	60
E.W.T.D. has increased registrar training time	Yes	1	5
	No	19	95
E.W.T.D. has reduced registrar training time	Yes	10	50
	No	10	50

Regarding impact of the EWTD on supervised training (Table 2), the majority did not feel the EWTD had an impact on consultant or registrar supervised training time (65%, n=13 and 60% n=12 respectively) in specific procedures e.g. lumbar puncture. There was unanimous agreement (n=20, 100%) that the EWTD did not increase consultant supervised training time while 35% (n=7) felt the EWTD had actually decreased consultant supervised training time. The majority, (60% n=12) stated that shift work did not improve teaching and training opportunities though 55% (n=11) did not feel it dis-improved them. When questioned if "working in a sub-specialty which involves significant emergency work reduces teaching and training opportunities in the EWTD working week",

35% (n=7) agreed, 25% (n=5) disagreed and it was not applicable in 40% (n=8). Regarding future teaching and training in a EWTD compliant hospital (Table 3), 16 (80%) would like more structured teaching and 17(85%) more supervised training sessions within the working week, while the majority stated that they would attend both outside the working week [17 (85%) and 16 (80%) respectively].

When asked to rank in order of importance for teaching opportunities 5 different teaching activities: 1 respondent missed the question but of the remaining 19, 12 (valid percent, 63.2%) ranked the consultant led formal teaching session as best, 3 (valid percent, 15.8%) ranked "consultant post call rounds" as best, 2 (valid percent 10.5%) ranked outpatient clinic and 2 (valid percent 10.5%) "consultant teaching ward round" best. The use of technology in education was warmly welcomed. Overall 75%(n=15) felt that real time video link from hospital teaching sessions to their home computer would be useful, 80% (n=16) felt web based teaching sessions would be useful, 70% (n=14) felt that sessions which could be downloaded to an iPod or iPhone would be useful while the majority (90%, n=18) felt that podcasts of guest lectures and establishment of a paediatric virtual learning centre for NCHDs would be useful.

Qualitative data identified that "being less tired" was the most important positive change and "missing teaching sessions post call" the main negative change since introduction of the EWTD. The focus group concurred with the questionnaire and uncovered a willingness to learn among NCHDs who swapped call to ensure presence on busy clinical days. Solutions offered to overcome EWTD challenges included, increased NCHD number, protected teaching time or earlier consultant post call ward rounds.

Table 3 Future teaching and training in a E.W.T.D. compliant hospital

		Frequency n	Percentage %
Like more structured teaching in working week	Yes	16	80
	No	4	20
Would attend structured teaching outside working week	Yes	17	85
	No	3	15
Would like more supervised training sessions incorporated into working week	Yes	17	85
	No	3	15
Would attend supervised training sessions outside their working week	Yes	16	80
	No	4	20

Discussion

The key points highlighted in this study, is that NCHDs in hospital paediatrics feel that the introduction of the EWTD has resulted in teaching sessions being more difficult to attend, with reduced consultant and registrar teaching time available to them and no improvement in structured teaching or training opportunities. The significant group of non-responders is concerning and may reflect disinterest in learning or inability to attend due to clinical commitment. Despite recent media attention, there is a significant paucity of data regarding the impact of EWTD on teaching and training in paediatric medicine. This is the first paper identified, despite the author's extensive search. A recent systematic review¹³ of the impact of reduction in working hours, for doctors in training, on post graduate medical education demonstrated that reducing hours from >80 hours per week has limited effect on postgraduate training, that these studies are often of poor quality revealing conflicting results and that only 2 out of 41 pertained to non surgical or non-anaesthetic specialities. The majority (27) showed no change in training outcomes, with 12 reporting a deterioration. Our study demonstrates a dis-improvement in teaching but not specifically in supervised training for a specific procedure. A recent Irish surgical study¹⁴ highlighted that 88% of surgical senior house officers reported a reduction in quality of surgical training at a University hospital since introduction of EWTD.

Specialities with small numbers of NCHDs find it more difficult to comply with EWTD so it is important that NCHDs demonstrated flexibility and interest to attend teaching and training in the

trainees own time, outside of work hours. This area should be maximised as advocated by Temple in the recent Medical Education England (MEE) report¹⁵. A willingness to learn during unpaid time is crucial to ongoing teaching and training and should prevent the need for increased length of training, if teaching and training is well structured. Being less tired is important to trainees regarding teaching and training and here this study concurs with others internationally,¹⁶ many of which highlighted that doctors after working 24 hour shifts, are more prone to making medical errors^{4,17,18}, have twice as many road traffic accidents¹⁹ and have a doubling of intrusive attentional failure at night²⁰. Missing teaching sessions was a significant negative of the EWTD identified in this study, which concurs with others¹³ that identified a "detrimental association between reduced working hours and measures of post graduate training and teaching"¹³. Our NCHDs called for more staff. Significant provision for extra staffing has been made in the USA and UK but not in Ireland. Potential options include, increase in consultant or registrar number, development of grade staff, introduction of interns to paediatrics and /or allocate certain tasks from NCHDs to other professionals e.g. phlebotomy.

A weakness of this study is that it was performed in one hospital only, which may lead to bias but CUH was the only EWTD compliant paediatric hospital with an ICU in the Republic at the time of the study. Prospective multi-centred studies are required. In the words of John Temple "training is patient safety for the next 30 years"¹⁵. The traditional experiential model of postgraduate training and education is not appropriate in 2013. Shift work has been identified as negatively impacting on training by reducing mentoring²¹, and trainer-trainee interactions¹⁵. Although the MEE report cites evidence that a consultant led service is cost effective,²² personnel reconfiguration to maintain trainee compliance with EWTD has been significantly expensive in other countries²³. In the current fiscal environment "cost neutral" is king. Overall, introduction of the EWTD is a positive change: it protects our NCHDs, our patients, makes practical sense and is the law. However, unless our approach to teaching and training changes, introduction of the EWTD may lead to a reduction in standard of same. Our challenge and obligation, as trainers is to provide excellence in structured teaching and supervised training within and outside the working week in a financially efficient way. Additionally, increased staff and financial input are required. Money remains an obstacle to implementation of EWTD in Ireland.

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Mountain Bikers Priapism: A Rare Phenomenon

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Abstract

Soft tissue and bony injuries are well described risks of the increasingly popular sport of mountain biking. Priapism, a persisting unwanted penile erection, as a result of perineal straddle injury due to a fall astride bicycle handlebar, is rare. We present a case of a competitive mountain biker with high flow priapism after such an injury who presented late but was successfully treated by non-invasive selective arterial embolization.

Case Report

A 22 year old male presented with a five week history of ongoing priapism after he had sustained a blow to perineum when he fell on to the crossbar of his mountain bike. Perineal pain, swelling and bruising had settled within days but he had ongoing priapism with rigid erection. Examination revealed no signs of injury but the penis was erect. Manual compression caused resolution of erection but the penis rapidly refilled with blood to full tumescence. Cavernous blood gas analysis was in keeping with arterial blood. Initial management involved pressure dressing for two weeks but release of pressure caused immediate recurrence of priapism, typical of high flow category.

Further management involved penile angiography (Figure 1) and selective arterial embolization (Figure 2), performed by interventional radiologist. Via the right common femoral artery, pelvic arteriography using a 5 French Omni flush catheter was followed by super selective catheterisation of the cavernosal artery using a 2.7 French micro catheter (Terumo). A fistulous communication between cavernosal artery and right corpus cavernosum was embolized using gel foam and four 0.018 platinum coils (3 mm x 7 mm). Priapism resolved immediately with uneventful recovery. At one month there was no recurrence of priapism and patient reported satisfactory erection and intercourse.

Discussion

Priapism, a prolonged unwanted erection for more than four hours in the absence of sexual stimulation, is classified as low flow or high flow. The commonest low flow variety is due to veno-occlusion, there is painful rigid erection with severely restricted

cavernosal blood flow. This warrants emergency intervention with penile drainage to prevent permanent damage. In high flow priapism, usually caused by trauma and considerably less common¹, there is unregulated arterial blood flow commonly due to traumatic fistula into the corpus cavernosum. As this is a painless erection, patients usually present late. In Kuefer's report on high flow priapism (202 cases), 70.5% had suffered blunt trauma or iatrogenic laceration of penile vasculature (perineal trauma 40.4%, straddle injury 24.4%, penile trauma 3.8%, complication of cavernosography 0.6% and penile re-vascularisation surgery 1.3%).² The general injury rate amongst mountain bikers is 1.54 injuries per 1,000 biker exposures.³ Soft tissue injuries and fractures are commonest, only 2 reports of priapism following cross bar straddle injury were found in medical literature.^{4,5}



Figure 1 Cavernal angiogram confirming arterial fistula to right corpus cavernosum of penis



Figure 2 Angiogram Post embolization (gelfoam insertion) confirming satisfactory occlusion of arterial fistula

Options for managing high flow priapism include watchful waiting, pharmacological, mechanical compression, selective embolization and surgical intervention. While 60% of cases resolve with watchful waiting, there is an incidence of long-term erectile dysfunction.⁶ Intra cavernosal injection pharmacotherapy generally fails because of the rapid washout of medication from the penis. Super selective embolization of the feeding artery occludes arterial inflow to the fistula to enable spontaneous healing. Non absorbable metallic micro-coils pose a risk of subsequent erectile dysfunction, therefore absorbable materials including Oxycel or Gelfoam are preferable with reported success rates 74 to 78%. Surgical intervention, the final option, carries 50% risk of future erectile dysfunction.⁷ We therefore recommend selective arterial embolization as optimal treatment for high flow priapism. It is minimally invasive and successful even in cases presenting late.

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Batteries Not Included

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Abstract

We report two cases of oesophageal lodgement of ingested button batteries (BB) in young children. In one case the diagnosis and subsequent treatment was made in a timely fashion and the patient suffered no sequelae. In the second case there was a delay in diagnosis and the patient subsequently suffered both early and late complications. The purpose of this report is to highlight the importance of the correct management of suspected BB ingestion.

Case 1

A 16 month-old female ingested a BB which was witnessed. She presented to the Accident and Emergency department within one hour of ingestion. On arrival she was noted to have a cough but was systemically well. A chest radiograph (CXR) confirmed oesophageal lodgement of the battery (Figure 1). An emergency oesophagoscopy was performed and the battery was successfully removed. Despite prompt treatment mucosal erosion was observed. She made an uneventful recovery and a contrast study performed prior to her discharge was normal. She has been discharged to the care of her GP with no anticipated sequelae.

Case 2

A 10 month-old male presented to another institution 2 hours following ingestion of a foreign body – presumed to be a coin. The child was systemically well. A CXR confirmed oesophageal lodgement of the foreign body. The child was transferred to our institution for further management. A repeat CXR confirmed the foreign body remained lodged. The appearances were consistent with a BB. An emergency oesophagoscopy was performed (18 hours post ingestion of the BB). Mucosal burn injury was observed but was not circumferential. The BB was embedded in the wall of the oesophagus and was extracted with difficulty. An initial CXR post procedure was normal. A repeat CXR was performed the following morning and demonstrated a right apical pneumothorax. On induction of anaesthesia for the chest drain insertion, the child decompensated and immediate needle decompression was performed with insertion of the chest drain. Subsequent contrast study showed right postero-lateral perforation of oesophagus (Figure 2). The patient was managed conservatively and a repeat contrast study was carried out after 12 days demonstrated no leak. The child was commenced oral feeds and was discharged home well. He has a repeat contrast study with a 50% stenosis of his oesophagus at the site of

lodgement of the battery. The child remains well and remains asymptomatic. He will be reviewed in the clinic in 6 months time. He may need intervention for this stenosis if he becomes symptomatic.

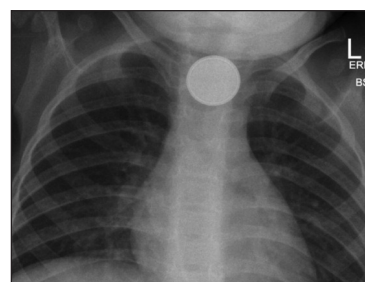


Figure 1 An antero-posterior chest radiograph demonstrating the radio-opaque foreign body in the oesophagus. Note the double rim or 'halo' effect of the button battery.



Figure 2

An antero-posterior chest radiograph demonstrating the leak of contrast postero-laterally (red arrows).

Discussion

BB's lodged in the oesophagus and airways pose the greatest risk of fatal, life-threatening or disabling outcomes¹. Delays in diagnosis undoubtedly lead to more severe complications and death. All deaths and the majority of significant or major complications occurred in children under 4 years of age¹. Lodged BB in the oesophagus can rapidly cause tissue damage by electrical burns, chemical burns and pressure necrosis. Where mucosal damage is noted on endoscopy, the child should be monitored closely and complications anticipated. Perforations and fistulas may take up to 18 days to develop and oesophageal strictures may take months to manifest¹. Without observed

ingestion, a circular radio-opaque foreign body should be treated with a high index of suspicion for BB ingestion in the paediatric population.

In 2010, Litovitz et al developed comprehensive management guidelines¹. These have been adapted by the National Battery Ingestion Hotline at the National Capital Poison Centre, in the USA. A radiograph is not required by all patients with ingested BB. A child over 12 years of age with a single battery ingested of less than 12mm, with no pre-existing oesophageal disease and who is completely asymptomatic can be managed safely without an x-ray. BB's located above the range of the radiograph have been missed¹. In patients with oesophageal lodgement of BB, expedient removal of BB is essential for a positive outcome (within two hours of ingestion)¹. Once the BB has passed distal to

the oesophagus, it can be left to pass spontaneously. In patients under 6 years of age, further imaging maybe warranted at 4 days post ingestion. If the battery is still in the stomach, endoscopic retrieval should be undertaken at that point¹. If a BB has passed distal to the oesophagus but a magnet was co-ingested, then the magnet should be retrieved endoscopically. If that is not possible then surgery is warranted, even if the patient is asymptomatic.

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First Birth Following Natural IVF/ICSI Treatment in Ireland

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Abstract

The first reported delivery following a natural cycle ICSI in Ireland is described. This technique has the potential to provide successful treatment for a selected group of patients.

Introduction

The first successful IVF pregnancy and live birth resulted from an unstimulated, natural cycle (ncIVF)¹, but soon afterwards this method was replaced by stimulated IVF^{1,2}. Controlled ovarian stimulation has potential negative consequences such as ovarian hyperstimulation syndrome (OHSS) and multiple pregnancy. To maximize the chances of pregnancy, multiple embryos are often transferred, resulting in 20-30% multiple pregnancy rates³. In IVF, the risk of twins is increased 20 fold, and higher-order multiples by about 400-fold compared to natural conceptions⁴. In high risk patients up to 20% of stimulated treatments lead to OHSS⁵.

Although current data are reassuring, the possibility of increased ovarian cancer risk after repeated stimulation remains a concern⁶. Furthermore, the creation of spare embryos from stimulated cycles causes ethical and religious dilemmas. Mild stimulation regimes have been proposed as patient-friendly approaches with a reduced risk of OHSS and pregnancy rates of 17-33% per oocyte retrieval, yet still with multiple pregnancy rates of 5-14%⁷. Additional strategies to restrict the incidence of multiple pregnancy include increased use of elective single embryo transfer and the use of antagonist protocols to significantly decrease the incidence of severe OHSS, yet neither strategy eliminates the risk. In contrast, ncIVF is associated with a negligible multiple pregnancy rate and no risk of OHSS. Natural cycle treatment is not without clinical risks, including exposure to potential surgical complications of oocyte retrieval for unifollicular aspiration, failure to retrieve an oocyte, and no embryo for transfer. The lower pregnancy rate per cycle and the reasons mentioned above could explain why ncIVF has not been accepted widely by reproductive medicine practitioners. We present the first delivery in Ireland following a ncIVF treatment.

Case Report

A couple with a 2.5 year history of primary subfertility attended for discussion of ART options. The female partner was 36 years old, nulliparous, with a regular cycle (3-4/28-30days). Anti-Mullerian hormone (24.21 pmol/L) and day 3 hormone profile were normal. Laparoscopy revealed stage I endometriosis, treated by Argon endocoagulation, and bilateral patent tubes. Her partner had no significant medical problems. Semen analysis showed oligoasthenozoospermia (count 11mil/ml, 40% motility) on the neat sample but an excellent final preparation (9mil/ml, 99%

motility) confirming suitability for IUI or IVF. Before commencing IVF they had two unsuccessful intra-uterine insemination (IUI) attempts. The couple were counselled regarding ART options and decided to proceed with a natural cycle treatment. On day 7 a 17mm follicle was evident in the left ovary and endometrial thickness measured 8mm with a triple line appearance. Hormonal profile showed LH=5.3U/L, E2=563pmol/L.



Figure 1 Developing follicle on day 7 of cycle.



Figure 2 Early pregnancy ultrasound demonstrating viable fetus.

Choriogonadotropin-a (Ovitrelle, Merck Serono) 6500IU was administered 32hrs before egg collection and one mature oocyte was retrieved. To reduce the risk of failure to fertilise, ICSI was used rather than IVF as the method of fertilisation. The metaphase II oocyte was injected and cultured in Sage fertilization and cleavage media until day 2 of development. A 4 cells grade 2a embryo was transferred. Luteal support was given for 15 days (Crinone gel 8% b.d., Merck Serono, UK). A positive urinary pregnancy test was noted 16 days post transfer and ultrasound 3 weeks later demonstrated an intrauterine gestational sac with a single fetus (CRL 11.2mm, 7+2/40) with cardiac activity present. Pregnancy progressed uneventfully and a healthy female infant was delivered by vacuum delivery at 39 weeks weighing 8.3 lbs.

Discussion

Natural cycle IVF is an effective treatment for ovulatory women undergoing assisted conception. Cumulative live birth rates after four cycles can reach 32%, comparable with 34% for conventional IVF⁸. Yet, ncIVF is cheaper, less time consuming requires less medication, and with costs per cycle 20-23% of stimulated IVF⁹. A potential downside of ncIVF is cancellation due to a spontaneous LH surge. Planning oocyte retrieval based on an LH rise requires intense monitoring and potential availability which

most laboratories cannot provide. Solutions include the use of indomethacin or GnRH antagonists which may postpone follicular rupture⁸. To date, most nclVF data is based on treatments offered to poor responders, where the chance of success will be low⁹. The lack of data on younger patients with good ovarian reserve needs to be explored further as high cumulative pregnancy rates should be achievable.

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A Holistic Assessment of Bariatric Surgical Outcomes in a Northern Irish Cohort

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To receive CPD credits, you must complete the questions online at www.imj.ie.

Abstract

The King's Obesity Staging system was developed to evaluate the effect of obesity treatments in multiple physical, psychological and functional domains. In this prospective cohort study, a Northern Irish cohort was scored using the King's Obesity Staging system before and 1 year after bariatric surgery. 71 individuals underwent surgery and 31 (44%) had type 2 diabetes. Bariatric surgery improved each health domain ($p < 0.05$). A subgroup with type 2 diabetes showed a significantly greater improvement in gonadal disease (polycystic ovarian syndrome and sub-fertility) ($p = 0.02$), and a trend towards greater improvement in cardiovascular disease ($p = 0.07$) compared with the non-diabetic subgroup. Half of those with pre-diabetes were normoglycaemic postoperatively ($p < 0.05$). The King's Obesity Staging system can be used to holistically evaluate the outcomes of bariatric surgery. Patients benefit from bariatric surgery in many ways, but those with diabetes may benefit more.

Introduction

Obesity is an ever-more prevalent condition that is associated with impaired functional status and a higher risk of physical disease and psychological morbidity¹⁻⁴. There is a marked direct and indirect cost associated with obesity, both from the increased use of healthcare services and medicines, and the reduced productivity associated with obesity^{5,6}. Despite the broad impact of obesity on multiple facets of wellbeing and health, much of the focus on outcomes of bariatric surgery, which is the most successful treatment, has been limited to weight loss and the remission of type 2 diabetes mellitus (T2DM). Whilst the assessment of weight may be important, it provides very little information on the improvement in overall health in the individual patient. The King's Obesity Staging system and its modified version were developed to address this shortfall in assessment^{7,8}. This approach comprises a standardised, holistic scoring system that stratifies the individual in severity stages of physical, psychological and functional domains. These 9 domains are named to allow an alphabetic mnemonic; Airways, Body Mass Index, Cardiovascular, Diabetes, Economic, Functional, Gonadal, Health Status perceived, and body Image⁷.

Bariatric surgery was not routinely available as part of the National Health Service (NHS) of Northern Ireland, but between 2008 and 2010 a cohort of 71 patients were referred to Imperial College Healthcare NHS Trust in collaboration with the NHS

hospitals of Northern Ireland. Patients were assessed pre-operatively at the Royal Victoria Hospital in Belfast, had their surgery and inpatient treatment at Imperial College Healthcare NHS Trust, and then were followed up at the Royal Victoria Hospital in Belfast. In this study we used the King's Obesity Score criteria to assess the clinical impact of bariatric surgery in this patient cohort.

Methods

In accordance with local guidelines, only patients with a body mass index (BMI) of greater than 35 kg/m² with obesity related co-morbidities were referred for surgery. The local Clinical Governance and Patient Safety committee at Imperial College Healthcare NHS Trust approved the study (Reference: ICHNT 09/612). The study was registered at ClinicalTrials.gov (NCT01112228). The type of surgical procedure was based on patient choice after multi-disciplinary team assessment and recommendation. The scoring of each patient was performed at the first visit to the service and 1 year after surgery, and was based on the collective assessment of the same multidisciplinary team. This team included a metabolic physician and bariatric nurse specialist. The numbers used to score the severity of each of the health domains were 0 for "normal health", 1 for "at risk of disease", 2 for "established disease" and 3 for "advanced or complex disease" (Table 1)⁸.

The scores before and after surgery were compared using paired tests including the Chi-squared test. The McNemar–Bowker test of symmetry was used to compare the overall distribution of patients across health stages before and after surgery (4 x 4 tables). The McNemar test was used to compare the proportions of patients within stages 0-1 and stages 2-3, respectively, before and after surgery (2 x 2 tables). Data are presented as means and standard deviations, or numbers as percentages. Significance was assumed at $p < 0.05$. Analyses were performed in PASW Statistics V.17 (SPSS Inc. Chicago, IL, USA).

Table 1 The Modified King's Obesity Staging system⁸. CPAP: continuous positive airway pressure, PCOS: polycystic ovarian syndrome, QoL: Quality of life

	Stage 0 Normal health	Stage 1 At risk of disease	Stage 2 Established disease	Stage 3 Advanced disease
Airways	Normal	Snoring	CPAP therapy	Cor pulmonale
BMI	<35kg/m ²	35-40kg/m ²	40-60kg/m ²	> 60kg/m ²
Cardiovascular	<10% risk	10-20% risk	Heart disease	Heart failure
Diabetes	Normal	Impaired fasting glucose	Type 2 diabetes	Uncontrolled type 2 diabetes
Economic	Normal	Increased expense for clothes and travel	Workplace discrimination	Unemployment due to obesity
Functional	Can walk three flights of stairs	Can walk one or two flights of stairs	Requires mobility aid	Housebound
Gonadal	Normal	PCOS or erectile dysfunction	Subfertility	Severe sexual dysfunction
Health Status (perceived)	Normal	Low mood or QoL	Depression of poor QoL	Severe depression
Image(body)	Normal	Dislikes body	Body image dysphoria	Eating disorder

Table 2 Detailed comparison of percentage of patients in each severity stage for each of the 9 health domains of the King's Obesity Staging system before and 1 year after surgery. Statistical analysis were performed using the McNemar–Bowker test

Domain		Stage 0 (%)	Stage 1 (%)	Stage 2 (%)	Stage 3 (%)	P value
Airways	Pre-operatively	1.4	50.7	45.1	2.8	<0.0001
	Post-operatively	47.9	40.8	9.9	1.4	
BMI	Pre-operatively	0.0	2.8	78.9	18.3	<0.0001
	Post-operatively	24.0	32.4	40.8	2.8	
Cardiovascular	Pre-operatively	12.7	43.5	40.0	3.8	<0.001
	Post-operatively	45.0	29.6	22.5	2.9	
Diabetes	Pre-operatively	36.6	19.7	31.0	12.7	<0.01
	Post-operatively	53.5	12.7	28.2	5.6	
Economic	Pre-operatively	23.0	9.4	25.8	41.8	<0.001
	Post-operatively	62.0	8.5	7.0	22.5	
Functional	Pre-operatively	0.0	36.6	50.7	12.7	<0.0001
	Post-operatively	43.7	32.4	23.9	0.0	
Gonadal	Pre-operatively	52.1	19.7	23.9	4.3	<0.0001
	Post-operatively	88.7	7.1	4.2	0.0	
Health Status perceived	Pre-operatively	1.4	21.1	62.0	15.5	<0.0001
	Post-operatively	56.3	35.2	4.3	4.2	
Image (body)	Pre-operatively	1.4	22.5	66.2	9.9	<0.0001
	Post-operatively	45.0	40.8	14.2	0.0	

Results

A total of 71 patients underwent surgery; 52 (73%) were female and 31 (44%) had T2DM. Mean age was 46 ± 8 years and pre-operative BMI 54 ± 8 kg/m². Patients underwent sleeve gastrectomy (n=37, 51%), gastric bypass (n=31, 45%) or gastric banding (n=3, 4%). One year after surgery, the mean BMI in the cohort was reduced to 39 ± 8 kg/m². Bariatric surgery improved each health domain (Table 2) with a significantly higher number of patients achieving scores of 0 ("normal health") and a significantly lower number of patients still having scores of 2 ("established disease"), postoperatively compared to preoperatively. The subgroup with T2DM had improvements in all domains, but also showed a significantly greater improvement in the domain of gonadal disease (polycystic ovarian syndrome and sub-fertility) compared with non-T2DM patients ($p=0.02$). There was also a trend towards greater improvement in the domain of cardiovascular disease when compared to the subgroup without T2DM ($p=0.07$). In total, 55% of patients with T2DM stage 3 improved by at least 1 stage, while 27% of patients with T2DM stage 2 became normoglycaemic. Half of the patients with pre-

diabetes (stage 1) normalised to stage 0 on post-operative assessment.

Discussion

In this study we applied the King's Obesity Staging system to the largest cohort of patients from Northern Ireland undergoing bariatric surgery for the first time. The main finding was that the staging system captured a number of obesity-associated co-morbidities, which a narrower focus on adiposity fails to incorporate. Bariatric surgery resulted in consistent and clinically significant improvements of these co-morbidities, with a significant number of patients being down-staged in terms of disease severity 1 year after surgery. The King's Obesity Staging system was devised to evaluate the effect of obesity interventions in a holistic, patient-centred fashion. These criteria are important, as they emphasise the multiple negative effects of obesity, and the positive consequences of its treatments. They shift the focus away from reduction of weight or glucose to the holistic management of obesity related complications. They also provide a framework for standardised multi-disciplinary team decision-making, communication, audit and clinical research. The system has been validated in previous studies and has been shown to have low inter-operator variability⁸. Our data is consistent with previous studies using the same criteria⁸; the improvements in airway disease, cardiovascular risk, psychosocial functioning, quality of life, daily function and mobility and sexual function are in line with those seen in previous studies⁹⁻¹². These improvements translate into economic benefits of reduced direct and indirect healthcare cost¹³.

The improvements in T2DM were also consistent with the impressive effects of bariatric surgery on glycaemia^{14,15}. Indeed, patients with established or complex T2DM (score 2 or 3) had greater improvement in glucose homeostasis than those with normoglycaemia or impaired fasting glycaemia (score 0 and 1). However, our data show a lower glycaemic remission rate of 27% at 1 year than rates previously published¹⁴⁻¹⁷. This finding may be due to a high percentage (29%) of patients with complex T2DM at baseline. We also detected a trend towards a lowering of cardiovascular risk. It is known that bariatric surgery is associated with cardiovascular risk reduction in the long-term^{2,10,18}. It could be that the shorter duration of follow-up did not allow sufficient time for this to be detected. Our data suggested that patients with T2DM benefited more in domains such as gonadal (polycystic ovarian syndrome and sub-fertility) and tended to benefit more in the cardiovascular domain than patients who pre-operatively did not have T2DM. This is consistent with other studies earmarking the group of morbidly obese patients with T2DM as those that benefit most from bariatric surgery¹⁸.

Both the King's Obesity Staging system and the Edmonton Obesity Staging system¹⁹ can be readily introduced in routine clinical practice. Potential improvements include the addition of more domains (i.e. reflux across the gastrooesophageal Junction ("J"), Kidney disease ("K"), Liver disease ("L"), Medication usage ("M") and Neurological disease ("N")). The use of weighing factors for each domain can improve patient selection based on local clinical priorities and evidence from randomised controlled clinical trials. The latter may also prevent or stop the selection of patient based purely on the BMI, which has a very low predictive value in terms of overall mortality²⁰. The limitations of the King's Obesity Staging system include the use of constantly changing definitions and targets (i.e. definition of T2DM or hypertension) and the incorporation of functional or psychological domains which can introduce variability in assessment. It can also be challenging to be clinically certain whether co-morbidities are obesity related or not. The use of categories to describe continuous variables (i.e. blood pressure) is an inevitable limitation of any staging system.

In conclusion, this study has shown that the King's Obesity Staging system can be applied to the largest cohort of patients from Northern Ireland undergoing bariatric surgery, not only to stratify them pre-operatively but also to capture the health

benefits achieved after surgery. All patients appeared to have some benefit, but those with T2DM benefited more. The approach of using a staging score instead of just using body weight can be readily adopted in routine clinical care and improve patient selection, team communication, clinical governance, service provision and resource allocation.

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Attitudes of Parents and Staff Towards Medical Students on the Paediatric Wards

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Abstract

This study investigates attitudes of parents and staff to medical students on paediatric wards in a Dublin teaching hospital. We invited 100 parents of patients and 30 staff involved in the care of children on the paediatric wards to participate. The majority of parents agreed or strongly agreed that they would be happy for a student to interview them (n= 87; (87%)), interview their child (80%) or examine their child (74%). Of 30 staff, 12 (40%) staff agreed that the presence of medical students on the ward increased their job satisfaction, 13 (43%) agreed or strongly agreed that medical student presence encouraged them to keep up to date with recent medical developments and 6 (20%) felt that it increased the quality of patient care. Attitudes of both parents and staff to medical students on paediatric wards are positive with both emphasising the need for professional behaviour.

Introduction

Despite substantial allocation of undergraduate student time to history-taking and examination on paediatric wards, the attitudes of parents and staff to this involvement was not researched to date. This contrasts with other specialties and paediatric outpatient settings. Patient attitudes toward medical student have been examined in previous studies¹⁻¹⁰. However, research to date has not included paediatric inpatients and studies of staff attitudes have focussed on general practitioners. This study investigates attitudes of staff and parents of paediatric inpatients towards medical students.

Methods

Two questionnaires for completion by parents and staff were prepared based on those used in previous studies of staff and patient attitudes towards medical students^{1-3,6,8}. These were approved by the Trinity College Dublin, Paediatrics Department. Parents of paediatric inpatients and staff involved in caring for paediatric inpatients were invited to participate. Exclusion criteria: parents of children in distress, non-English speaking parents and parents deemed inappropriate by nursing staff. Responses were input to a spreadsheet using an agreed coding pattern. "No preference" was recorded where the respondent noted as such or the answer was left blank. Results were analysed using SPSS. Chi-square test was performed to compare differences between parent and staff opinions.

Results

One-hundred parents of children ranging from 23 days to 15 years (median= 7.5 years) completed the questionnaire. Fifty-four (54%) were male and 55 (55%) had been visited by a student during their stay in hospital. Length of hospital stay ranged from 1 - 16 days (median= 2 days). The questionnaire was completed by 30 staff, of whom 5 (16.7%) were consultants, 10 (33.3%) NCHDs, 4 (13.3%) CNMs, 10 (33.3%) staff nurses and 1 (3.33%) ward clerk. Of 30 staff, 26 (87%) interacted with students at least weekly.

Parent Attitudes towards Students

Most parents agreed or strongly agreed that they would be happy for a student to interview them (n= 87; 87%), interview their child (80%) or examine their child (74%). However, half of staff agreeing or strongly agreeing that parents welcomed the presence of students on the paediatric ward. Of 100 parents, 12 (12%) agreed or strongly agreed that the gender of students was important in allowing them perform history-taking or examination. Of that group, 4 (33%) would prefer a female student, while the remainder expressed no preference. Almost one-third (31%) of parents would prefer students to visit alone, 29% had no preference as to whether students should visit in pairs or singly and 40% would prefer that students visit in pairs, the current policy in the hospital. Only 3 (3%) parents disagreed or strongly disagreed that they would be comfortable to share personal or private information about their child with a student, while over half of parents (59%) would be comfortable to do so.

Staff Attitudes towards Students

Of 30 staff, 12 (40%) staff agreed that the presence of students on the ward increased their job satisfaction, 43% agreed or strongly agreed that students encouraged them to keep up to date with medical developments and 20% felt that it increased the quality of patient care. Half of staff disagreed or strongly disagreed that students "get in the way" on the ward, while only one staff member (3%) agreed.

Attitudes towards Student Professionalism

Both parents and staff agreed that a number of professional behaviours by students were important. Ninety-one percent of parents and 100% of staff agreed or strongly agreed that students should introduce themselves by name. Staff were significantly more likely to hold this view (p value = 0.016). There was also agreement or strong agreement from 92% of parents

and 100% of staff that students should identify themselves as students, with staff again being significantly more likely to be in strong agreement with this view (p value =0.020). Staff (93%; n=28) were more likely to agree or strongly agree that how a student dresses is important than parents (46%) (p value <0.001). Interestingly, relatively few staff (37%) or parents (13%) agreed or strongly agreed that students pose an infection control risk. Staff were more likely to agree with this risk than parents (p value <0.001).

There was a strong preference for medical students always to be accompanied by a qualified doctor when interviewing or examining children among both parents and staff: 43% of parents agreed or strongly agreed with this, along with 43% of staff. Parents were more likely than staff to disagree with this statement (p value =0.040). Most staff (63%) agreed that medical students should be allowed to read medical charts, though 81% of parents also agreed or strongly agreed with this. This difference was not significant (p value =0.098). Both parents and staff felt that interviewing and examining parents and children contributes to student's learning; 96% of parents and 90% of staff agreed or strongly agreed (p value = 0.19).

Discussion

Consistent with previous studies, both parents and staff welcome the presence of students on paediatric wards. Parents were comfortable allowing students to take histories and perform examinations. Both medical and nursing staff noted improvements in their work satisfaction due to the presence of medical students, consistent with research among general practitioners. In contrast to previous studies in obstetrics^{1,2}, student gender was not important to parents. This may relate to the lack of intimate examinations performed by medical students in paediatric rotations. Although a substantial minority of parents would prefer students to attend alone rather than in pairs, this raises child protection issues, therefore, we would not suggest that current college policy advising medical students to examine children in pairs be altered. Many parents and staff felt that students should always be accompanied by a qualified doctor when examining children. This might be ideal for both teaching and for ensuring the well-being of children, however, is not practical in ensuring that students acquire adequate exposure and confidence in paediatrics.

Positively, most parents were happy for students to access medical charts and to discuss personal information with students, contrasting with concerns raised in general practice settings¹¹. This highlights the privileged position which medical students hold and reinforces the importance of confidentiality. The importance of professional behaviour to both parents and staff was highlighted by the emphasis placed on introduction, identification and dress. Reassuringly, students are not viewed as an infection control risk by either group, but must uphold this perception through appropriate hygiene measures.

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Obstetric Medicine – Bridging the Gap

Sir,

Thrombosis and thromboembolism are the most important causes of direct maternal death. It accounted for an average of 16.3% of maternal mortality in the united kingdom between 1985-1999.¹ General physicians are required to consult on medical complications in obstetric patients, without having received formal specialist training in this area.² We report a case of cerebral venous thrombosis in pregnancy which illustrates the need for the sub-speciality of obstetric medicine. A 44 year old Caucasian female at 12 weeks gestation presented to the Emergency Department with a 3 week history of progressively worsening temporal headache (unresponsive to analgesics) and numbness of the right arm and right side of the face. She was a non-smoker and non-drinker with 2 children and 2 previous miscarriages.

On examination, she was febrile (temperature 38.0C) tachycardic, BP was 114/70 mmHg with GCS 14/15. There were no meningeal signs /neurological deficit at this stage. FBC, renal profile and LFT were normal but ESR and CRP were both elevated at 55 and 65 respectively. Unenhanced CT Brain was normal and CSF revealed normal CSF glucose, elevated CSF protein at 44.4mg/dl and no organisms on gram stain. She deteriorated with a GCS of 6/15, new right-sided hemiparesis, sustained bilateral clonus, hypertonia and hyperreflexia with bilateral up going plantars. She was immediately intubated and transferred to the ICU. CT Venogram showed extensive venous thrombosis involving the superior sagittal sinus, straight sinus, transverse sinus extending to the internal jugular vein. This was also evident on MRI/MRV. The patient was diagnosed with extensive cerebral venous thrombosis and commenced on therapeutic low molecular weight heparin. Her thrombophilia screen (Day 2 on admission) was negative. She made a remarkable recovery and her foetal ultrasound showed a viable foetus at 13 weeks gestation. She was then discharged on subcutaneous therapeutic Low Molecular Weight Heparin for 8 months (including 2 months post-partum) with monitoring by the haematologist. She subsequently had a healthy female neonate. She was advised against use of oral contraceptives and informed that she might require prophylactic LMWH for future pregnancies.

CVT accounts for 0.5%-1% of all strokes annually.³ In pregnancy it is most common in the third trimester and first four weeks post-partum.³ Diagnosis is difficult because of 1) the variability of symptoms, 2) the heterogeneity of etiological factors 3) limitation of contrast study due to foetal exposure to radiation 4) altered physiology of pregnancy (increased level of clotting factors) making interpretation of thrombopjilia screening difficult. Cerebral venous thrombosis can have varied clinical presentations but headache seems to be the most frequent symptom. In pregnant women, headaches are usually innocent and more than 90% of cases are migraine or tension type headache hence it is easy for physicians to overlook this life threatening condition.⁴

The above case required ongoing input from the neurologist and haematologist with minimal input from the obstetrician. Thus our view is that the field of obstetric medicine is one which deserves specialist training and a defined curriculum as part of the physician's training as it would bridge the gap between internal medicine and obstetrics.

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The Economics of Medical Education

Sir

Frohlich and Moriarty are to be congratulated for bringing to the fore the system of medical education in Ireland that creates specialists for export¹. Emigration is a personal and professional upheaval that is forced upon many doctors of all specialties, and

undoubtedly it does result in economic waste. However the financial figures that Frohlich and Moriarty cite as the amount of economic waste may not be accurate. Firstly the authors state that the cost of educating a student in the UK from entry to

medical school to completion of the intern year has been estimated as £334 000 (€391 726). However medical education in the UK is quite different to that in Ireland. Most medical schools in Ireland have a pre-medical year – this would result in higher costs in Ireland.

Student tuition fees in the UK are much higher than student service fees in Ireland – this pushes more of the cost of training onto the state in Ireland. There is also a very different undergraduate medical education system in the UK compared to Ireland and once so again costs will not be comparable. According to Frenk et al the cost of undergraduate education in most Western European countries is approximately €307 800 – this may be a better estimate of the cost in Ireland². However an estimate it undoubtedly is, and it leads us to a first conclusion: we simply don't know how much we spend on undergraduate medical education. Secondly the authors estimate the cost of delivering postgraduate education from medical school to consultant level at €960 000. However there are difficulties with this figure. Even though postgraduate doctors are being educated they are also contributing to the health service, and so return on investment is being delivered by these doctors even if they do not practice as consultants in Ireland.

This is as it should be – indeed according to Janet Grant “the strength of medical education is its integration of service and training”³. The figure of €960 00 in any case is a worst case

scenario – it assumes that emigrant doctors leave Ireland when they have completed their specialist training – in fact many of them do so part of the way through their training. This leads us to a second conclusion: spend on postgraduate medical education is complex – it is difficult to distil it to a single figure. The authors rightly cite the financial wastage that results from high emigration amongst our trained specialists. If the health service does not listen to clinical and educational arguments, then it might listen to economic ones. However we must be sure of our figures if we are to win these arguments.

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Osteoporotic Vertebral Fractures

Sir

Osteoporosis is a common condition characterized by a decrease in the density of bone, decreasing its strength and resulting in fragile bones susceptible to fracture. It poses a significant public health issue. Prevention of osteoporotic complications by treating appropriate patients is the gold standard¹ however fractures can still occur. Most osteoporotic fractures occur in the hip, spine or wrist. 1.5 million osteoporosis-related fractures occur in the United States each year with vertebral fractures the most common at approximately 750,000/year. Vertebral fractures often occur at the thoracolumbar junction (T12-L1) because a change in the facets provides less resistance to anteroposterior displacement at this level. Fractures may result in limitation of ambulation, depression, loss of independence, and chronic pain. It has been shown that patients with severe osteoporosis and vertebral fracture(s) benefit from prompt assessment and intervention to prevent further fractures and complications.

In response to this we initiated a “Rapid access clinic for osteoporotic vertebral fractures” for GP referrals (With the assistance of an Eli Lilly grant). Clinic launch was in January 2009 with a referral proforma required and available on the hospital website. After one year we audited this new service, which runs in conjunction with our routine Rheumatology out-patient clinics. All patients' notes for all patients referred and accessed via the rapid access clinic were audited. Patient referrals being from clinic launch in January 2009 to January 2010. Osteoporosis risk factors, blood results, fracture details, DEXA reports and patient demographics were analysed.

Fourteen patients were referred and managed in this clinic from 14 different GPs during the twelve month period. All patients were seen within a mean of 9 days of referral (range: 2 – 21; median=6). Twelve (86%) were female and two (14%) male, with

a mean age of 68yrs (range: 50 – 82; median=65). All patients were Irish. Twenty-nine fractures were recorded among these patients (mean = 2; mode = 1; range: 1 – 7) with six lumbar and twenty-three thoracic fractures, leading to a modal HAQ score (Health Assessment Questionnaire Score) at review of 1.125/3 (range: 0.375 – 2.375/3). The mean (normal range) serum calcium, alkaline phosphatase, PTH and Vitamin D levels were 2.38 mmol/L (2.2-2.6 mmol/L), 91 U/L (20-70 U/L), 62 ng/L (15-65 ng/L) and 62 pmol/L (75-200 pmol/L) respectively. All patients were commenced on PTH therapy along with calcium and Vitamin D supplementation. T-scores (mean) on DEXA imaging prior to PTH therapy were -3.2 and -2.3 for spine and femur respectively. Interestingly, 9 patients were newly diagnosed with osteoporosis due to the presenting fracture(s). From our experiences rapid access clinics have a valuable role to play in managing patients with osteoporotic related vertebral fractures.

Despite the successful management of numerous patients so far, primary care physicians need a reminder of this service to highlight its availability and maximise patient care. The importance of mineral/vitamin supplementation also needs to be highlighted, as is evident by the low Vitamin D levels recorded. We hope that our service will continue to provide timely intervention for these patients in the coming months and years.

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The Impact of Immigration on Children's Development

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This book is a collection of eight distinct studies dealing with the subject matter of immigration and the impact there-of on childhood development. Each chapter provides a background on the specific study subject matter, study setting and methodology and results with a summary on the findings/discussion. The audience that would benefit most from this book include those concerned with child health and development, public health and epidemiology.

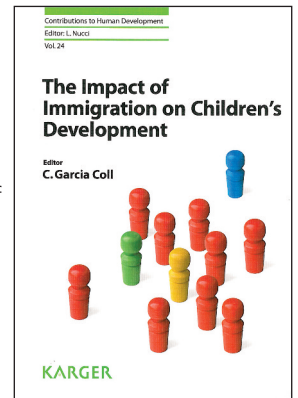
With worldwide immigration becoming increasingly common, the subject matter is very current. A large driving force of migration being economic of nature, the main groups affected would be those participating in the active working force, i.e. young and middle-aged adults with families. We know from the literature that the age at which significant change (being positive or negative) in childhood occurs is pivotal in the ultimate outcome of child health, growth and development. This compilation of studies provides a varied exploration on immigration at different ages of childhood and subsequent outcomes in these particular age groups. Furthermore, various countries are involved in this collection of studies, providing perspectives on differential immigrant groups, enabling the reader to form a comparative understanding. Methodology and study results are for the most part clearly explained. The potential for ecological fallacy is strongly recognised throughout the narrative and limitations addressed.

This compilation of work provides an excellent introduction as to what might underlie the differentiation in adaptation/development patterns in immigrant children. However, care has to be taken when interpreting these findings as various microsystems and proximal factors of importance were not consistently explored or controlled for. As the authors acknowledge, the ultimate understanding of the factors driving the different paths of development warrants further exploration. Although for the most part data from longitudinal datasets were analysed, some of the studies dealt with only a specific point of data collection. As the concept of development entails specific change in temporal fashion, the reader must be warned not to draw conclusions on developmental trajectories from cross-sectional data analysis.

In conclusion, the authors have to be commended on their invaluable contribution to examining and elucidating an extremely complex phenomenon.

K Viljoen

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Sleep Apnoea and its Relationship with Cardiovascular, Pulmonary, Metabolic and Other Morbidities

F Khan, C Walsh, SJ Lane, E Moloney. *Ir Med J.* 2014; 107: 6-8.

Question 1

The number of patients in the study was

- a) 228
- b) 238
- c) 248
- d) 258
- e) 268

Question 2

The mean BMI in the OSAS group was

- a) 31.37
- b) 32.37
- c) 33.37
- d) 34.37
- e) 35.37

Question 3

The proportion with hypertension in the OSAS group was

- a) 30.1%
- b) 31.1%
- c) 32.1%
- d) 33.1%
- e) 34.1%

Question 4

The proportion with diabetes in the OSAS group was

- a) 13%
- b) 14%
- c) 15%
- d) 16%
- e) 17%

Question 5

The proportion with Asthma in the OSAS group was

- a) 16.2%
- b) 17.2%
- c) 18.2%
- d) 19.2%
- e) 20.2%

Organ Donation following the circulatory determination of death (DCD): An audit of donation and outcomes following renal transplantation

J O'Rourke, JA Zimmermann, W Shields, D McLaughlin, P Cunningham, C Magee, DP Hickey. *Ir Med J.* 2014; 107: 11-4.

Question 1

The number of patients who died within the 90 minute period following the withdrawal of care was

- a) 7
- b) 8
- c) 9
- d) 10
- e) 11

Question 2

The number of patients who received a renal transplant was

- a) 16
- b) 17
- c) 18
- d) 19
- e) 20

Question 3

The number of patients who received a lung transplant was

- a) 1
- b) 2
- c) 3
- d) 4
- e) 6

Question 4

The number of male patients in the DCD protocol was

- a) 6
- b) 7
- c) 8
- d) 9
- e) 10

Question 5

The number of donors from whom heart valves were recovered was

- a) 1
- b) 2
- c) 3
- d) 4
- e) 5

A Holistic Assessment of Bariatric Surgical Outcomes in a Northern Irish Cohort

KJ Neff, C Prener, LL Chuah, K O'Donnell, IF Godsland, AD Miras, CW le Roux. *Ir Med J.* 2014; 107: 24-6.

Question 1

The number of patients who had type 2 diabetes was

- a) 29
- b) 31
- c) 33
- d) 35
- e) 37

Question 2

In order to be referred for bariatric surgery the patient's BMI had to be greater than

- a) 32
- b) 33
- c) 34
- d) 35
- e) 36

Question 3

The number of female patients in the study was

- a) 50
- b) 52
- c) 54
- d) 56
- e) 58

Question 4

The mean age of the patients undergoing surgery was

- a) 42 years
- b) 44 years
- c) 46 years
- d) 48 years
- e) 50 years

Question 5

The mean BMI of the patients before bariatric surgery was

- a) 52
- b) 53
- c) 54
- d) 55
- e) 56



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