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Imitation, The Greatest Form of Flattery?

Sir,

A recent interesting case at our institution reminded us to remain cognisant of the oldest known venereal disease; known as 'the great imitator', syphilis is a sexually transmitted infection caused by the spirochete Treponema pallidum.

A 40-year-old Romanian man presented with weakness and paraesthesia in his left arm and leg, and an occipital headache. His wife noted he was disorientated and had slurred speech. He had no facial droop, gait or visual problems. He had no past medical or relevant family history. On presentation, within hours of symptom onset, he was asymptomatic and neurological exam was normal except for reduced power in the left upper limb (4+/5). Blood investigations were essentially normal but his CSF was cloudy with leukocytosis and an elevated protein (120mg/dl). CSF and serology was negative for all viruses tested, as well as paraneoplastic, vasculitic and autoimmune markers. Contrast CT Brain showed an ill-defined area of hypo-attenuation in the right temporal fossa and an area of low attenuation in the right thalamic region. A subsequent MRI Brain showed extensive highT2/FLAIR signal within the same region. Neuroradiology review of the imaging emphasized that the mesiotemporal T2 hyperintensity was "virtually pathognomonic" for herpes encephalitis[1]. He was treated with IV acyclovir based on these clinical and radiological findings however repeat imaging and LP showed persistent abnormalities. After further discussion with the National Virus Reference Laboratory, his CSF was tested for syphilis and was positive. On questioning, he denied any prior history of syphilis. He was discharged to the Infectious Disease clinic and completed treatment with IM procaine penicillin/probenicid. Follow up serology showed a decline in RPR (Rapid Plasma Reagin) and repeat LPs showed a reduced protein count.

Syphilis has various clinical, laboratory and imaging findings, all of which lack specificity, which can make diagnosis difficult. Of those who contract syphilis, 4-10% will develop neurosyphillis[2]. In the recent past the clinical manifestations have changed; this may be due to the routine use of penicillin antibiotics for non-syphilitic infections and the emergence of immunosuppression in HIV. There is no gold standard diagnostic test. The CDC advises that VDRL (Venereal Disease Research Laboratory test) and RPR (Rapid Plasma Reagin) should be used as screening tests. A positive screening test should lead to a treponemal test specific for syphilitic antibodies and subsequently have the titre results reported quantitatively. Neurosyphilis is diagnosed by a combination of CSF VDRL, cell count, and protein level[3] in the correct clinical setting. A single intramuscular injection of long acting Benzathine penicillin G is the treatment of choice for primary, secondary or early latent syphilis[3].

Neurosyphilis, the 'great imitator', has innumerable clinical manifestations, and non-specific investigation findings, which can make diagnosis difficult. Therefore, it is recommended that every patient with neurological or psychiatric symptoms without unambiguous causes should have a serology sent for syphilis. Similarly, all patients with radiological features suggestive for Herpes encephalitis who are not improving on IV Acyclovir should have CSF tested to exclude neurosyphilis.

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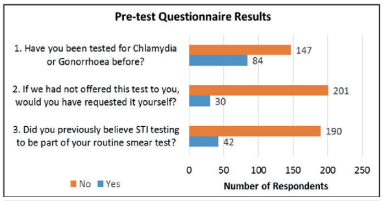
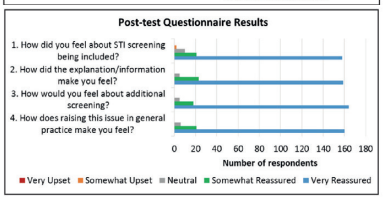
In this Month's IMJ

Screening for chlamydia is acceptable and feasible during cervical screening in general practice: Hassan et al examined 138 women for Chlamydia and Neisseria Gonorrhoea when under undertaking cervical screening. They detected 6 cases of Chlamydia but no cases of Neisseria Gonorrhoea.



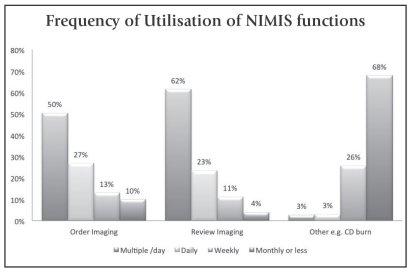


The positive impact of bariatric surgery on sleep: Xie et al report on the outcomes for 167 patients who underwent bariatric surgery. The surgery had a positive benefit on the patients' sleep patterns. Thirty nine patients were able to discontinue the positive airway therapy.

Table 1: Percentage of patients with improved FOSQ scores (in categories)

Category (Mean Change)	Non OSA (n= 40)	OSA (n = 51)	All patients (n = 91)
General Productivity Score	+0.12	+ 0.31	+0.23
Social Outcome	+0.22	+0.38	+0.31
Activity Level	+0.65	+0.67	+0.65
Vigilance	+0.27	+0.48	+0.38
Intimacy	+0.65	+0.46	+0.54
Total Score	+1.93	+2.34	+2.14
% of pts with Improved Scores	**80.0%**	**94.1%**	**87.9%**

Examining the end-user experience of the national integrated medical imaging system (NIMIS): Smith et al surveyed users experience with the NIMIS service. Most responses were positive but a number of concerns were raised. These included problems with ordering and reviewing scans, identifying the appropriate code for a study, dissatisfaction with the feedback they received in relation to requests.



Standards in operation notes- is it time to re-emphasise their importance: Cahill et al examined 30 random operation notes before and after an educational intervention. Following the educational intervention there were some improvements in the operation notes and also some deteriorations. There should be 12 data points for each operation note but only one of the doctors was 100% compliant- the others falling between 65% and 87%. The potential role of an electronic record is discussed.

Table 1: Good Surgical Practice Operation Note Data Points

- Date and time
- Elective or emergency
- Names of surgeon & assistants
- Incision
- Operative diagnosis
- Operative findings
- Any problems/complications
- Any extra procedure, and reason for it
- Detail of tissue removed, added or altered
- Identification of any prosthesis used
- Details of closure technique
- Post operative care instructions
- Signature

In-hospital cardiac arrest at Cork University Hospital: O'Sullivan and Deasy identified 63 patients with an in-hospital cardiac arrest (IHCA). The survival rate in patients with a shockable rhythm was 68.4%, and only 9.1% in those with an unshockable rhythm. The outcome was poorest for those on the wards compared with other areas of the hospital.

Table 1 Baseline Characteristics of All IHCA

		IHCA	ROSC	Survivors	P-value
Age	Median years (IQR)	74.3 years	73.2 years	66.6 years ±	<0.05 ±
Sex					
Male	N (%)	40 (63.4%)	29 (72.5%)	10 (25.0%)	
Female		23 (36.5%)	17 (74.0%)	7 (30.4%)	
Aetiology					
Cardiac	N (%)	28(44.4%)	23 (82.1%)	11 (39.3%)	
Metabolic/Other		16 (25.4%)	10 (62.5%)	4 (25.0%)	
Respiratory		6 (9.5%)	5 (50.0%)	1 (16.6%)	
Septic		6 (9.5%)	5 (83.3%)	0 (0.0%)	
Gastrointestinal		3 (4.8%)	1 (33.3%)	0 (0.0%)	
Neurologic		3 (4.8%)	3 (100.0%)	1 (33.3%)	
Unclear		1 (1.5%)	1 (100.0%)	0 (0.0%)	
Arrest Rhythm					
Shockable	N (%)	19 (30.2%)	17 (89.5%)	13 (68.4%)*	<0.001*
Unshockable		44 (69.8%)	29 (65.9%)	4 (9.1%)	
Witnessed					
Witnessed	N (%)	55 (87.3%)	44 (80%)**	17 (30.9%)	<0.005**
Not Witnessed		8 (12.7%)	2 (25.0%)	0 (0.0%)	
Monitored					
Monitored	N (%)	38 (60.3%)	33 (86.8%)***	14 (36.8%)	<0.006***
Not Monitored		25 (39.7%)	13 (52.0%)	3 (12.0%)	

The value of the combined assessment of COPD in accurate characterization of stable COPD: Sahadevan et al point out that the old system (GOLD 1234) of assessing COPD was based on spirometry, while the new system (GOLD ABCD) is based on combined disease assessment. The new tool has resulted in an increased number of COPD patients being placed in the more severe categories. The findings highlight that previously high-risk patients had been undetected.

Table 1: Difference between GOLD 1234 and GOLD ABCD classification

	GOLD 1234	GOLD ABCD
Year of introduction	2007	2011
Number of variables	1	4
Variables:		
Degree of airflow limitation (FEV1)	Yes	Yes
Assessment of respiratory symptoms	No	Yes
Assessment of number of exacerbations	No	Yes
Assessment of future risk of exacerbations	No	Yes
Classification system	Stage 1,2,3,4	Grade A,B,C,D

The clinical utility of a low serum ceruloplasmin measurement in the diagnosis of Wilson disease: Kelly et al studied all the serum ceruloplasmin measurements undertaken at CUH. Among 1573 patients, 96 patients had a low ceruloplasmin level. Of these 96 patients, three had Wilson disease, a positive predictive value 11.1%. The authors point out that other confirmatory tests are needed including examination for KF rings, 24 urinary copper, liver biopsy, and AIP7B mutations.

Table 1: Demographics of the tested population

	Total tested population
Number of patients	1,573
Gender (Male/Female)	55.2%/44.8%
Age range (years) (mean [SD])	1-93 (45.04 [18.07])
Serum Ceruloplasmin level range (g/L)	0.0499–1.8
Median Ceruloplasmin level (g/L) (IQ range)	0.28 (0.24–0.35)
Referral source by subspecialty:	
Gastroenterology	38.6%
General Internal Medicine	17.6%
Neurology	17.1%
General Practice	7.1%
Endocrinology	4.1%
Emergency Medicine	3.3%
General Surgery	3%
Psychiatry	1%
Other	7.6%

Is the current BST eportfolio fulfilling its role in the training of clinical medicine SHOs?: Grennan et al surveyed trainee and trainers' opinion on the eportfolio. There are a number of areas of dissatisfaction. It appears to be limited in highlighting the trainee's strengths and weaknesses.

Table 2: Summary of responses from Consultants

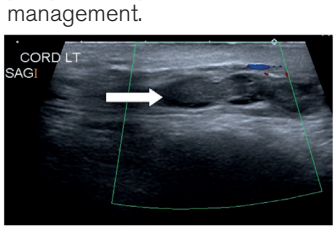
Question	Agree/ Strongly Agree n (%)	Undecided n (%)	Disagree/ Strongly Disagree n (%)
The ePortfolio is an effective educational tool for junior doctors	8 (33.3)	9 (37.5)	7 (29.2)
My trainees' development has benefited from the use of the ePortfolio	6 (25.0)	10 (41.7)	8 (33.3)
The ePortfolio website is easy to use	3 (12.5)	7 (29.2)	14 (58.3)
The ePortfolio is useful in highlighting trainees' strengths and weaknesses*	4 (16.7)	7 (29.2)	12 (50.0)
I believe reflective practice plays an important role in medical training	24 (100.0)	0 (0.0)	0 (0.0)
I review my trainees' reflective logs during our meetings	9 (37.5)	4 (16.7)	11 (45.8)
The personal development plan is a useful tool in helping trainees to focus their aims and objectives	12 (50.0)	9 (37.5)	3 (12.5)
I have received sufficient training on how to use the ePortfolio	5 (20.8)	3 (12.5)	16 (66.7)
I know what trainees are expected to document in the ePortfolio	14 (58.3)	4 (16.7)	6 (25.0)
I know how many of each type of assessment trainees are required to do	9 (37.5)	3 (12.5)	12 (50.0)
The number of assessments required of trainees is excessive	7 (29.2)	10 (41.7)	7 (29.2)
I am familiar with the contents of my trainees' curriculum	18 (75.0)	1 (4.2)	5 (20.9)
I believe my feedback sessions with trainees is useful for their development*	16 (66.7)	5 (20.8)	2 (8.3)
I find it difficult to fit in the required number of assessments and feedback within my clinical schedule	15 (62.5)	5 (20.8)	4 (16.7)
	Always/Often n (%)	**Sometimes n (%)**	**Rarely/ Never n (%)**
I only perform workplace-based assessments if requested by a trainee prior to the clinical encounter/ procedure in question	7 (29.2)	12 (50.0)	5 (20.8)
I am physically present for any clinical encounter that is signed off as an assessment	18 (75.0)	3 (12.5)	3 (12.5)
I give verbal feedback immediately after the assessment taking place	18 (75.0)	9 (8.3)	4 (16.7)
	<5mins	**5-10mins**	**>10mins**
On average, how long is spent giving feedback on a workplace assessment?	6 (25.0)	11 (45.8)	7 (29.2)
	Never	**1-2 years**	**>2years**
When was the last time you received formal training in giving feedback?*	10 (41.7)	4 (16.7)	8 (33.3)

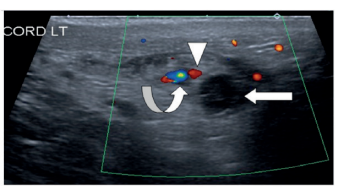
Management of patients with subclinical hypothyroidism in primary care: McCarthy et al studied subclinical hypothyroidism (SCH) in a cohort of over 65 year old patients. There were 99 patients with SCH. One fifth were treated with thyroxine. Of the remainder 6 patients progressed to clinical hypothyroidism.

Table 1: Management/outcome of SCH

	Clinic 1 n=32	Clinic 2 n=24	Clinic 3 n=43	Total n=99
Treated with thyroxine, number (%)	6 (18.8)	10 (41.7)	6 (14.0)	22 (22.2)
No action, number (%)	14 (43.8)	9 (37.5)	30 (69.8)	53 (53.5)
≥2 elevated TSH tests	11 (34.4)	5 (20.8)	12 (27.9)	28 (28.3)
1 elevated TSH test	3 (9.4)	4 (16.7)	18 (41.9)	25 (25.3)
Reverted spontaneously to normal TSH, number (%)	9 (28.2)	4 (16.7)	5 (11.6)	18 (18.2)
Progressed to overt hypothyroidism, number (%)	3 (9.4)	1 (4.2)	2 (4.7)	6 (6.1)

A rare cause of testicular pain: thrombosis of the pampiniform plexus: Tanner et al describe a case of a 23 year old man with testicular pain secondary to thrombosis of the pampiniform plexus. The thrombosis resolved with conservative management.





A Correct Diagnosis is of Increasing Importance

All clinicians are aware of the importance of reaching the correct diagnosis. It is impressed on every medical student and trainee from the outset. Khuller et al argue that diagnosis is more important than ever before because the patient has so much to lose when there is a misdiagnosis. A diagnostic error may result in the patient being denied timely, effective therapy or being administered potentially toxic, incorrect medications. Where a prompt treatment could have returned a patient to full health, the consequences of a wrong diagnosis can be devastating. Getting the right diagnosis is key for the patient. In addition to being made in a timely fashion, the diagnosis and implications must be communicated effectively. The key issues are timeliness and accuracy. Timing may be minutes in acute situations or weeks in relation to subacute disorders.

Over-diagnosis is also a concern. This is when a condition is diagnosed that does not go to cause any symptoms or ill-health. This can result in the blurring of the borders between health and disease. While over-diagnosis is not an error, it can result in harm, over treatment and unnecessary anxiety. Gwande has described it as the consequence of over testing. Specialties with a high risk of litigation such as neurosurgery, orthopedic surgery, emergency medicine are more likely to order an excess of investigations. The problem is compounded by patients' belief that more tests means better care.

The IOM report 15 years ago 'to err is human' highlighted the issue of medical error. The critical piece missing from the safety framework has been diagnostic error. Errors in diagnosis enacted or delayed can have serious consequences. The IOM in its new Report has proposed actionable solutions. It is recognized that diagnostic error data are sparse. The most useful sources have been case notes reviews, malpractice claims, and postmortem findings. When malpractice claims are studied it is found that 70% of misdiagnosis cases relate to outpatient activity but inpatient claims are more likely to be associated with serious harm or death. The misdiagnoses that are most frequently cited are cancers, heart disease, cardiovascular disease, infections and stroke. In Paediatrics, misdiagnosis accounts for 61% of total malpractice claims, whereas in Obstetrics it accounts for 9% of claims.

Voluntary reporting and discussions about diagnostic adverse events has great potential in prevent of repetitive errors. The available studies suggest that the diagnostic error rate is between 7% and 17% in hospitalized patients. In approximately half of these cases, the error could be harmful. Human failures appear to be the main cause of diagnostic error but organizational factors are frequently implicated.

It is increasingly being accepted that patients are central to the solution and that good diagnostic systems are a collaborative effort. The nurses' input should be actively sought because they spend most of their working day with their patients. The stereotype of the physician working and making diagnoses on his own is becoming an outmoded one. It is more frequently being asked whether doctors spend sufficient time talking to patients in order to pick up important cues about their symptoms. Studies have found that experienced nurses accumulate more cues from a patient than their novice counterparts.

The institution must have a culture that welcomes the diagnostic dialogue. Advances in the learning sciences, such as clinical reasoning and processing, have not been utilized sufficiently.

The current understanding of clinical reasoning is that it is based on the dual process of non-analytical and analytical thinking. The non-analytical process is fast, intuitive, and requires little working memory capacity. In contrast the analytical process is slow and places a heavy burden on the working memory. The non-analytical system of reasoning is suited to high volume, low acuity medical activities such as ED. The analytical, slow approach is applied to low volume, high acuity medical care as encountered in neurology. Heuristics are mental shortcuts employed to reach a rapid diagnosis. They are frequently employed by experienced doctors. As one become more experienced one develops larger stores of mental models of disease conditions. They can, however, lead to errors when the patient presents with atypical symptoms. When a heuristic fails it is called a cognitive bias. A mistake may happen when the initial clinical impression is not altered in the light of new information. Premature closure is when a diagnosis is quickly made without considering other possibilities, for example attributing back pain to a disc problem. The analytic process can be adversely affected if the doctor fatigued or sleep deprived. When a patient presents, the doctor gathers information and compares that that information with the knowledge that he has about diseases. Probability reasoning is when certain symptoms and signs either confirm or exclude a diagnosis. If a particular sign must always be present, then its absence rules the disease. However in most situations, symptoms and signs are not exclusively specific.

Goals should be put in place to improve the diagnostic process. There needs to be a continued emphasis on diagnostic skills and training for both undergraduates and postgraduates. The culture and work systems of healthcare organisations should reflect the importance of the clinical diagnosis. The collaboration between all healthcare professionals should be further strengthened. A reporting system that learns from errors in a non-judgmental environment should be developed. Clinicians should be more open to feedback on their clinical activity and where the team could do better. Electronic health care record offer potential benefit because all the clinical, radiological and laboratory data will be brought together in a readily accessible vehicle. There should be funding for research into the diagnostic process and the root causes of errors.

It is timely that there should be a renewed emphasis on the importance of the diagnostic process.

JFA Murphy
Editor

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A Review of Craniofacial Referrals to the NPCC and Introduction of a New Referral Pathway

The National Paediatric Craniofacial Centre (NPCC) at Temple Street Children's University Hospital provides specialist cares for over 660 children annually with syndromic and non-syndromic craniosynostosis, craniofacial tumours, craniofacial trauma, facial clefts, craniofacial growth disorders and facial asymmetry, torticollis, positional plagiocephaly and facial nerve disorders. The centre was established in the early 90's by Professor Michael Earley, Consultant Plastic Surgeon and Mr David Alcutt, Consultant Neurosurgeon. The appointment of Mr Dylan Murray, Consultant Craniofacial and Plastic Surgeon and Mr John Caird, Consultant Neurosurgeon in 2008 brought with it the expertise to manage the full remit of craniofacial disorders in the unit. Before this time complex craniofacial conditions may have required referral to craniofacial centres in the UK for treatment. The service further evolved in 2013 with the appointment of a clinical nurse specialist. Craniofacial MDT clinics are run in Temple Street Children's University Hospital (TSCUH) and at the satellite centres based in St James Hospital and Our Lady's Children's Hospital, Crumlin. A quarterly facial palsy MDT clinic is base at Temple Street Children's University Hospital (TSCUH).

The reasons for referral of children to the centre are varied. A retrospective audit of the origin and nature of referrals received between the 31st June 2012 and 1st July 2013 was undertaken. This review was approved by the TSCUH audit committee. Almost half (48.6%) of the referrals to the service were from a Neonatologist or Paediatrician. General practitioners or community services comprised the second largest group accounting for 28.4% of the referrals. Irregularities in shape and flattening of the head, including plagiocephaly were common terms used (45.3%). Synostosis (20.7%), syndromic synostosis (2.2%), soft tissue or isolated bony growths (11.2%), facial asymmetry (7.8%) and concerns regarding fontanelles closed or open (5.0%) were other common referrals. In contrast to some craniofacial units in the UK, craniofacial vascular anomalies, positional plagiocephaly and disorders of facial nerve are treated by the NPCC[1].

There were three peaks in the age of the children at referral; 4 to 6 months, one to two years, and three years and older. Age at referral is an important factor for some craniosynostosis as it will determine the surgical approach taken. Referrals from GPs were more often older than six months (57.7%). A referral to a Paediatrician instead of directly to the craniofacial services may have delayed referral to the craniofacial clinic but we cannot confirm this as this cohort did not show a proportionally older age of the children referred from Paediatricians.

The referral letter provides vital information required for appropriate triaging. Craniofacial synostosis particularly with signs of raised intra-cranial pressure, craniofacial tumours and craniofacial traumas are categorised as priority referrals and usually seen at the next available clinic. Over the time frame most, 96.1% of children were seen within six month of referral. The children who fell outside this time frame rescheduled their appointments by personal preference. The provisional diagnosis assumed by the referring physician was consistent with the diagnosis at outpatients for 49.7% of the cases; Neonatologists and Paediatricians were consistent in 52.3% of referrals and GPs were consistent in 34.0% of referrals. In the time frame 14.5% of children were determined normal at the clinic appointment. It is possible that children referred with positional plagiocephaly had resolution of their skull flattening at the time of review in clinic and were thus diagnosed as normal.

As is consistent with population density the majority of the referrals were from Dublin (36.6%) with 8.7% from Cork and 5.5% from Galway or Kildare. Multiple births were a feature in 4.4% the referrals. A positive family history of craniofacial conditions was noted for 2.3%. This included Crouzon's syndrome and macrocephaly.

No preliminary investigations are expected for referral to the centre particularly if it delays the referral. A common mis-endeavour when craniosynostosis is suspected is to perform a plain skull x-ray. This investigation is challenging to report and does not give a definitive diagnosis of craniosynostosis- in the year review of referrals, 3.4% of children were referred with an incorrectly reported x-ray. The investigation of choice is a 3D skull and facial bones CT scan[2]. Children under the age of 3 years require a full anaesthetic or sedation to obtain good quality views and thus availability of a paediatric anaesthetist is essential. For the same reason, MRI imaging for investigation of soft tissue or intra-cranial abnormalities are best performed with paediatric anaesthetic support and within a multidisciplinary setting with a high patient throughput. With expansion of its case load from 2008 to 2012 the centre has seen a 209% increase in the number of referrals received. This is in part a reflection of increased awareness and diagnosis of conditions in the community and paediatric services. This increase has been reported in other craniofacial units[1].

In order to guide referring physicians on important information required and aid in the management of an increasing number of referrals, the NPCC have introduced a structured referral form available on the www.cuh.ie and www.craniofacialireland.ie websites. The form is similar to referral forms used at the craniofacial units in The Hospital For Sick Children Toronto and Great Ormond Street Hospital[3,4]. The aim is that this referral form will standardise referrals and ensure that there is consistency across the professional bodies. Pre-clinic information regarding patient weight, height and head circumference parameters can be plotted at referral and referenced again at outpatients to monitor growth and development. Radiology images, if available can also be forwarded with referrals and uploaded to the hospital network for discussion at multidisciplinary meetings. Interpreter services can be arranged pre-appointment if required. The craniofacial team may also contact referring physicians if more information is required.

The new referral pathway will enhance communication between the NPCC and referring speciality and the family of children referred. This in turn will aid in the management of the increasing number of referrals. A new information section on the website detailing features of the most common craniofacial disorders will hopefully aid diagnosis and act as a useful guide for referrals.

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Screening for Chlamydia is acceptable and feasible during Cervical Screening in General Practice

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Abstract
The incidence of Chlamydia trachomatis (CT) & Neisseria gonorrhoeae (NG) are rising in Ireland.[1] Both are often undiagnosed and may cause infertility amongst other complications.[2] CT/NG screening is not routinely offered during cervical cancer screening. This study aimed to ascertain the feasibility and acceptability of screening for CT/NG at time of smear and to measure the diagnostic yield. Screening was offered to women aged 25-40 years attending four participating general practices as part of Cervical Check.[3] A retrospective review of the three months preceding the study period, indicated that out of 138 smears, CT/NG testing was performed in 10 (7%) of cases. 236 (93%) patients consented to screening for CT/NG. The detection rate for Chlamydia was 6 (2.4%), with no positive results for NG. Feedback from patients was positive. Interestingly, 42 (18%) of participants who completed the questionnaire believed STI screening was already part of the routine smear.

Introduction

The incidence of Chlamydia trachomatis (CT) & Neisseria gonorrhoeae (NG) are rising in Ireland. Between 2000 and 2014 the annual notifications of CT in Ireland have increased from 1343 to 6707 and GC notifications have risen from 290 to 1336. In 2014 women accounted for 3623 (54%) reported cases of CT and 223 (17%) cases of NG.[1] CT is asymptomatic in 85% of women and 40% of men[2]. CT and NG cause infertility as well as other health complications.[2] Screening for CT and NG satisfies Wilson and Jungner's criteria for screening.[4] Nucleic acid amplification tests (NAATs) of endocervical samples remain the gold standard in testing for NG in women, with sensitivity and specificity of 94.2% and 99.2% respectively, compared to 55.6% and 98.7% for NAATs of urine specimens.[5] Sensitivity and specificity of NAATs for detecting CT in endocervical specimens is 96.7% and 99.1% respectively, versus 92.5% and 98.6% for urine specimens.[5] Screening for CT/NG during cervical screening is clearly of interest. This study aims to ascertain if it is feasible for GPs and acceptable to patients to combine screening for CT/NG with cervical screening, and to measure the diagnostic yield of STI screening, thereby ascertaining if it is worthwhile exploiting the potential health gain at a useful and established point of care relating to sexual health.

Methods

Ethical Approval was obtained from Trinity College Dublin HSE GP Training Scheme Ethics Committee. The study was carried out in 4 Teaching Practices (3 urban, 1 suburban) (July 2014 - January 2015). Initially we retrospectively assessed the number of women who underwent opportunistic CT/NG testing in the participating practices at the time of cervical screening in the previous 3 months. The target population for STI screening included all patients aged 25-40 years attending as part of the national cervical screening programme (Cervical Check) over a 6 month period. Uptake and opt out rates were recorded. Women attending for cervical screening were made aware of the study using an information sheet and waiting room notice. This enabled informed consent by advising on the purpose of the study and invitation to decline or participate. Written consent for the study was obtained along with consent for cervical screening. An endocervical swab was performed at time of smear, and forwarded to the National Viral Reference Laboratory. The order in which the swab and cervical smear were taken wasn't specified. Those who consented to participate filled out a short pre-test and post-test questionnaire illustrated in Figures 1 and 2 respectively.

Patients who tested positive for CT or NG were offered a follow up appointment at the practice free of charge. In those who tested positive for CT, a prescription for 1g of azithromycin was given and contact tracing for partners was provided. Regular partners of those who tested positive were offered treatment regardless of their own test results. Patients testing positive for NG were to be referred to the Department of Genitourinary Medicine and Infectious Diseases (GUIDE) Clinic at St James's Hospital Dublin for intramuscular (IM) ceftriaxone treatment and culture. All patients testing positive for CT or NG were recommended to have additional screening performed (syphilis / human immunodeficiency virus (HIV) / and Hepatitis B), at either the practice or the GUIDE clinic and to have full contact tracing.

Results

Two hundred and fifty five patients were included in the study. Of these, 236 (93%) consented to screening for CT/NG. Three patients were excluded based on age. All other participants were between 25 and 40 years (median age = 33 years). Five samples were not processed. Three of these were incorrectly labelled, one was lost in the laboratory and one was not sent. Six patients (2.4%) tested positive for CT; there were no positive results for NG. The retrospective review indicated that out of 138 smears performed, in the three months prior to the study period, CT/NG testing was performed in 10 (7%) of cases.

The results from the pre-test questionnaire are illustrated in Figure 1. This demonstrated 36% (n=84) had been tested for CT or NG previously. When asked, 30 (13%) of respondents indicated they would have requested it themselves. Furthermore, 42 (18%) of respondents believed that STI testing was part of the routine smear test. The results of the post-test feedback questionnaire are illustrated in Figure 2.

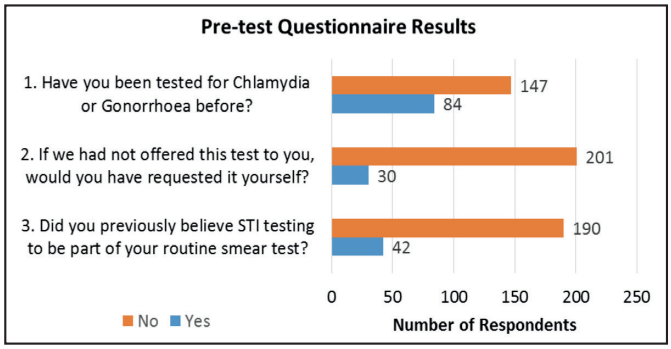

Figure 1

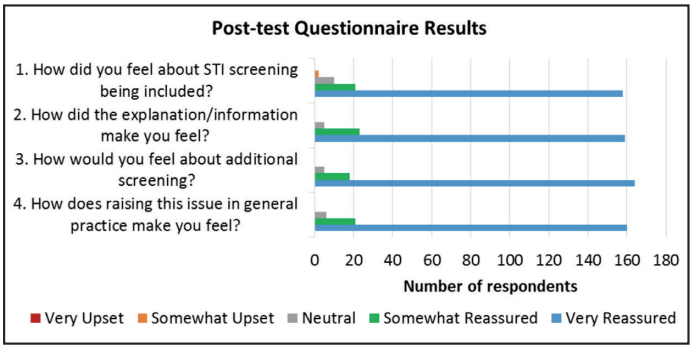

Figure 2

Discussion

Our initial retrospective review of CT/NG screening at the time of smear testing demonstrates opportunistic screening is not routine practice and confirms a low rate (7%) of patient requested testing. The high participation rate (93%) and largely positive results of the feedback questionnaire clearly indicate CT/NG screening is both feasible and acceptable to patients and providers alike. From 2007-2009 The Royal College of Surgeons in Ireland carried out a cost efficacy study examining opportunistic screening for CT in Ireland, ultimately concluding that it was ineffective.[6] While a high level of uptake and a good level of patient acceptability was noted, less than 10% of eligible candidates were actually offered screening. GPs cited lack of payment, time pressure (screening at that time involved more time consuming, less efficient urinalysis PCR testing) and difficulty of raising the issue of STIs as obstacles to screening. This study highlights an excellent opportunity to increase the uptake for screening at the time of smear test, when the previously described obstacles are not present, and results here supersede this previous study. While there is no national CT screening programme in Ireland, the UK National Chlamydia Screening Programme actively screens those aged under 25 years, the population generally considered to be at highest risk of infection. Figures from the UK show a prevalence rate for CT of 3.1% among sexually active 16-24 year olds.[7] American data has shown increasing prevalence of STIs in patients aged 24-40 years from 2008 – 2012 suggesting a shift in the perceived at risk population groups.[8] Thus the diagnostic rate of CT (2.4%) in this study of 25-40 year olds supports the notion that screening in an older age group may also be of benefit. In a comparable, albeit smaller study, Harris reported an even more significant CT detection rate of 8.4% in patients undergoing routine cervical smear testing.[9]

In 2011, Ogbechie and colleagues found 71.7% of younger women mistakenly believed cervical cancer screening also screened for CT.[10] While numbers in our study were lower, almost one in five (18%) participants believed STI screening was carried out during smear taking. The need for greater patient education is clearly evident regarding this aspect of cervical screening, and separately, the need for STI testing, and what it involves. In our study approximately half of those who gave a reason for not participating believed they were not at risk, as in a long term relationship or not sexually active and the remaining respondents had been recently tested. A study by Bowden and colleagues in 2008 demonstrated routinely offering Chlamydia screening at the time of smear approximately doubles the rate of Chlamydia testing in general practice.[11] The rise in STI testing rates from a baseline of 7% up to 93% during the study period shows an even more marked effect and affirms the high level of patient and provider acceptability. There were no positive results for NG infection despite the number of diagnoses having increased considerably in the past decade. This may in part be attributable to the fact that this increase has affected males more than females with a ratio of 4 to 1.[1]

Limitations of this study are as follows. We did not include women under 25, those over 40, and men (except as part of contact tracing). The lower age limit reflects the lower age limit of the CervicalCheck programme. The upper age limit reflects the concern that older women attending for cervical screening who consider themselves to be at low risk of STI may be upset at being offered screening. The study did not include a cost benefit analysis, and while feedback from service providers in practices was anecdotally strongly positive, cost benefit was not systematically measured. While it was beyond the scope of this feasibility study to carry out a full cost analysis of implementation of a national screening programme, the HPSC carried out a pilot study of opportunistic screening for genital Chlamydia trachomatis infection in Ireland between 2007 and 2009 which included a cost analysis.[6] Based on their list of costs, in combination with the findings of our study, we estimate that Chlamidia screening alone per year would cost €5,256,489. No comparable cost analysis was available to estimate the cost of screening for NG. Offering STI screening is a sensitive subject that can be difficult for GPs and potentially offensive to patients. The acceptability and feasibility of testing during cervical screening to both patient and doctor in this study strongly suggests it is an appropriate setting. By normalising STI testing, patients are less likely to feel they are specifically being targeted, and stigma associated with STI screening is likely to be reduced.

This study demonstrates an efficient additional screening opportunity in a group of patients at risk of an often clinically silent but important condition, for which an effective treatment is readily available. The study builds on the trust, acceptability and confidentiality of the general practice setting, and practically reflects an important and well recognised growing public health risk among sexually active adults. It includes individuals who may not otherwise have considered screening, creating an opportunity to systematically provide important information to the population at risk. We believe the results from this study strongly support the need to conduct a regional or population based study on screening for Chlamidia trachomatis as part of cervical screening.

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The Positive Impact of Bariatric Surgery on Sleep

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Abstract
Between June 2009 and July 2012, Apnoea-Hypopnoea Index (AHI) and Functional Outcomes of Sleep Questionnaires Scores (FOSQ) were prospectively evaluated pre- and post-operatively in patients undergoing bariatric surgery. A total of 167 subjects were studied, 75.4 % were females. The median age was 46 (14-75) years and BMI 49 (36-69) kg/m2. Ninety two (55.0%) patients were diagnosed with Obstructive Sleep Apnoea (OSA) preoperatively. Fifty (54.0%) required positive airway pressure (PAP) therapy. The mean reduction in BMI post bariatric surgery was 12.2 ± 4.52 kg/m2 at 6.56 ± 2.70 months. Eighty (87.9%) reported improved sleep quality reflected in improved scores in all domains of the FOSQ ($p<0.001$, paired t-test). Improvement in FOSQ scores remained significant ($p<0.05$) in those with and without OSA. Thirty-nine (90.7%) patients discontinued PAP due to resolution of daytime sleepiness. In conclusion, weight loss following bariatric surgery has a positive impact on sleep in-patients with and without OSAS.

Introduction

Over the last few decades, the prevalence of obesity has escalated worldwide. The World Health Organization (WHO) has predicted that, by Year 2015 more than 700 million people will be obese (BMI>30kg/m2).[1] According to the SLAN 2007 Survey of lifestyle, Attitudes and Nutrition in Ireland report[2], one in four Irish adults are obese and two out of five Irish adults – 39% (45%of men; 33% of women) are overweight. The obesity pandemic is an alarming problem from a public health perspective and requires a deeper appreciation of its pathophysiology, clinical manifestations and treatment options. The increase in obesity has translated into many obesity-associated co-morbidities such as type II diabetes, dyslipidemia, cardiovascular diseases and sleep- disordered breathing. This in turn leads to an estimated life expectancy reduction of 5-20 years in severely obese patients[3] on top of a significant reduction in patient's quality of life. Bariatric surgery is currently the only treatment which has been shown in randomized-controlled trials, to produce sustained weight loss and improved quality of life in morbidly obese patients. Anecdotally, weight loss following bariatric surgery is associated with a marked improvement in level of daytime sleepiness. However, few studies have attempted to confirm or quantify these changes and to examine whether the improvement in sleepiness is limited to those suffering from obstructive sleep apnoea (OSA).

Methods

Between June 2009 and July 2012 a prospective evaluation of consecutive bariatric patients attending the Bon Secours Hospital Cork was performed. One hundred and sixty seven patients underwent surgical intervention during this period. Surgical intervention was strictly in accordance with international guidelines for bariatric surgical intervention whereby bariatric surgery is offered as a type of treatment for people with obesity with BMI of 40kg/m2 or more, or between 35kg/m2 and40kg/m2 and other significant co-morbidities (e.g. hypertension, diabetes, metabolic syndrome) that could be improved with weight loss.[4] All patients were discussed at a multidisciplinary team meeting with surgeon, cardiologist, endocrinologist, sleep physician, psychologist, dietician and physiotherapist before proceeding for bariatric surgery.

All patients were interviewed pre-operatively and diagnostic sleep studies were performed if OSA was suspected. Ninety-two (76.7%) patients were referred with a pre-existing diagnosis of OSA. For the purposes of this study age, gender, surgical procedure and date, and Body Mass Index (BMI) pre-operatively and at six months post-operatively were retrieved from the Cork Clinic Bariatric Surgery database. Apnoea Hypopnoea Index (AHI) value was recorded in all patients who underwent sleep studies. OSA severity was defined as severe (AHI≥30), moderate (AHI 15 to <30) or mild (AHI 5 to <15). AHI <5 was indicative of absent OSA. Patients with documented severe OSA (AHI ≥30) were invited for repeat sleep study at 6 months post bariatric surgery. Requirement for positive airway pressure (PAP) therapy for treatment of sleep-disordered breathing was recorded. Subsequent discontinuation of positive airway pressure therapy post-operatively on resolution of OSA symptoms was also recorded. The Functional Outcomes of Sleep Questionnaire (FOSQ) is a measure used to assess sleep quality. It has a reported test- retest reliability of0.90 and an internal reliability of alpha = 0.95. It is a tool that has been successfully used to distinguish patients with clinical sleep problems from a healthy control group (T157 = -5.88, p =0.0001).[5] In a 30item FOSQ, patients rate their ability to perform various activities based on a sleepiness scale of 0 to 4, where 0 indicates that a person does not participate in this activity for other reasons, 1 indicates extreme difficulty and 4 indicates no difficulty with the activity. Five FOSQ subscale scores namely, general productivity, social outcome, activity level, vigilance and intimate relationships and sexual activity are also obtained. All patients completed the FOSQ pre-operatively and at approximately six months post-operatively.

Statistical analysis was performed utilizing SPSS version20.0 (IBM, Armonk, NY). Descriptive statistics (frequencies, means, median, range etc) were utilized to describe patient parameters such as age, gender, type of bariatric procedure, BMI and OSA severity. Pre and Post Operative FOSQ subscale scores and total scores were compared using the paired t test. The Chi square test was utilized to compare OSA and non-OSA patients. P values of<0.05 were accepted as statistically significant. When applicable, data are presented as mean ±standard deviation.

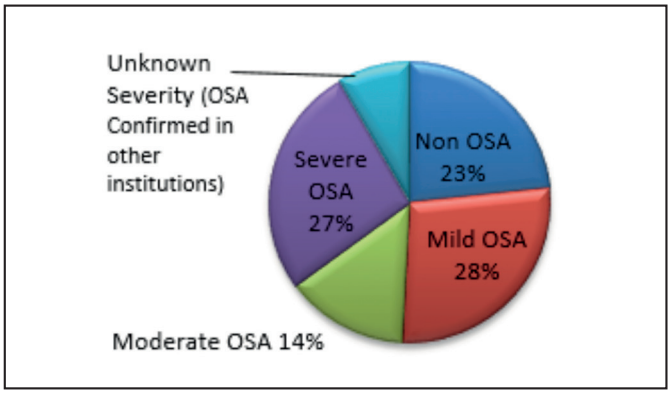

Figure 1: Prevalence of OSA; 92 (76.6%) out of 120 indicated sleep studies were diagnosed OSA

Results

One hundred and twenty six (75.4%) were female. One hundred and twelve (67.7%) underwent laparoscopic gastric bypass. Fifty two (31.1%) underwent laparoscopic sleeve gastrectomy and three (1.8%) underwent gastric banding. One hundred and twenty (71.9%) had diagnostic sleep studies with ten (10.9%) from other institutions. OSA was diagnosed in 76.6% of the 120 sleep

CPD available online at www.imj.ie and questions on page 351.

studies with an overall prevalence of 55.1% in our bariatric cohort studied (Figure 1). However, the mean (range) AHI was 26 (2.8), in the moderate range. Also, fifty five (59%) of those diagnosed with sleep apnoea preoperatively had two or more significant co-morbidities requiring daily medical intervention (Figure 2). The majority of the patients had significant reduction in AHI values postoperatively. Nineteen (36.5%) of patients who had previously been utilizing masks accepted an invitation for repeat sleep studies at 6 months post-surgery. Four of these nineteen patients had no recorded pre-operative AHI readings. Seventeen (89.5%) of these 19 patients were sufficiently cured of OSA to discontinue PAP. Two patients had persisting severe OSAS despite a marked reduction in BMI. Fifty (54%) patients had required PAP therapy preoperatively. Seven of these 50 patients were un-contactable. Thirty-nine (90.7%) of the 43 patients who did submit for follow-up reported a dramatic post-operative improvement in their sleeping and have since been taken off their PAP devices.

Table 1: Percentage of patients with improved FOSQ scores (in categories)

Category (Mean Change)	Non OSA (n= 40)	OSA (n = 51)	All patients (n = 91)
General Productivity Score	+0.12	+ 0.31	+0.23
Social Outcome	+0.22	+0.38	+0.31
Activity Level	+0.65	+0.67	+0.65
Vigilance	+0.27	+0.48	+0.38
Intimacy	+0.65	+0.46	+0.54
Total Score	+1.93	+2.34	+2.14
% of pts with Improved Scores	**80.0%**	**94.1%**	**87.9%**

Ninety-one (54.5%) completed pre and post FOSQ questionnaires were collected. Improvement in total FOSQ scores of 87.9% remained statistically significant ($p<0.05$) in all patients (Table 1). Patients were further stratified into non-OSA (n=40) and OSA groups (n=51). In the non-OSA group, sub-category groups such as activity level ($p<0.001$), vigilance ($p=0.049$), intimacy ($p<0.001$) and total score ($p=0.002$) demonstrated statistically significant improvement when FOSQ subscale scores were compared pre and post operatively. The sub-category groups of general productivity ($p=0.232$) and social outcome ($p=0.135$) also improved, but not to conventional significance. In the OSA group, all FOSQ sub-category groups (except intimacy) demonstrated statistically significant improvement ($p<0.005$). Activity levels and vigilance FOSQ categories remained consistently statistically significant in all bariatric patients with activity levels having the top increment scores in both non-OSA and OSA groups.

Discussion

There was a high prevalence (55%) of sleep disordered breathing in our cohort of bariatric surgical patients. This is similar to the findings in the LABS-2 study.[6] Post-operatively, there was a mean reduction in BMI of 12kg/m2. Thirty-nine (90.7%) with OSA were deemed sufficiently cured that they could discontinue positive airway pressure. The surprise finding was the significant improvement in the level of daytime sleepiness in patients without OSA following surgery. A significant number of patients (41.6%) required positive airway pressure (PAP) for treatment of OSA. We chose to repeat sleep studies in only those with severe OSA (AHI>30) six months post-surgery. Despite our best efforts, only 19 out of 52 (36.5%) accepted this invitation. The reason for this is not fully established but most likely related to the patients spontaneously abandoning their masks when their sleeping improved and then being disinclined to make the effort to return for further sleep studies. Although we could not measure a repeat AHI for these patients, we were at least able to determine whether or not they were utilizing their PAP devices. Those who did re-attend for sleep studies were deemed sufficiently improved (except for two patients) that PAP was no longer deemed necessary (Figure 3). It is important to note that many patients post-surgery had a persistently elevated AHI (>5) despite an impressive weight loss. This provokes the argument that OSA still exists and that positive airway pressure should be continued. However, these patients had no symptoms of OSA and the AHI was only in the mild to moderate range (AHI <30) i.e. CPAP therapy not indicated. Furthermore, subjects in this study were mostly female (75.4%), in their 40s, and had a very elevated preoperative median BMI of 49kg/m2, but a moderate level of OSA (AHI15-30). In most studies linking OSA with cardiovascular disease, a very different phenotype of OSA is seen comprising of mainly men, a lighter BMI, roughly 5 years older, but more severe OSA (AHI>30).

We used the Functional Outcomes of Sleep Questionnaire (FOSQ) as a marker of sleep quality pre and post-surgery. Ideally we would have liked to perform full polysomnography (PSG) to objectively measure sleep quality in all patients, pre and post-surgery. However, this was not practical because PSG is a scarce resource and there it is not clinically indicated to perform repeat sleep studies on asymptomatic patients with either none to moderate OSA. On the other hand, the FOSQ is very quick and easy to complete, and has been validated in many studies as an acceptable reflection of sleep quality. What is surprising is that patients without a pre-existing diagnosis of OSA reported improved daytime sleepiness post-bariatric surgery. Poor sleep in the morbidly obese is likely multi-factorial. Obesity itself is a cause of poor sleep because of difficulty sleeping in "too small" a bed. Losing weight and bulk, should theoretically make it easier

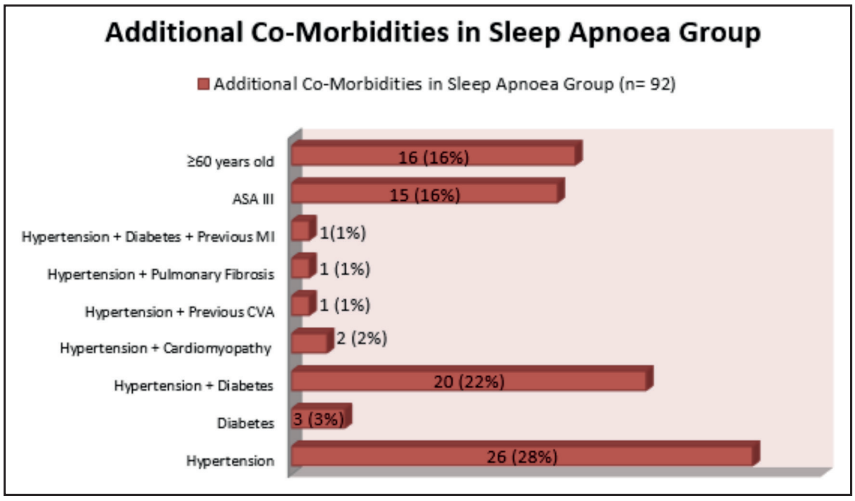

Figure 2: Additional co-morbidities in sleep apnoea group (n=92). Patients diagnosed with hypertension, diabetes are on daily chronic medical intervention

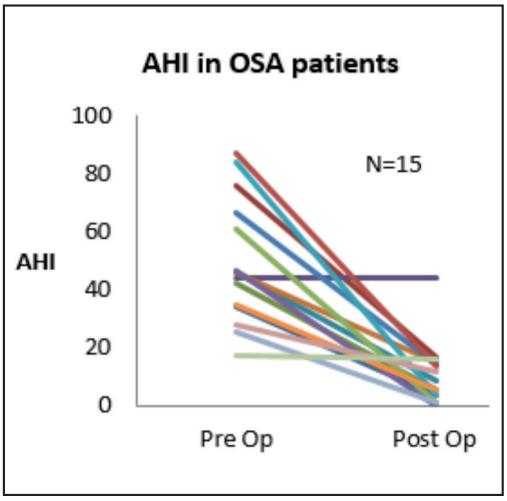

Figure 3: AHI values before and after bariatric surgery

to sleep. Many patients with morbid obesity suffer from low self-esteem which in turn leads to anxiety/depression. These negative feelings and the treatment with anxiolytics or antidepressants compromise sleep further. Many of the study group snacked at night preoperatively. This is well known to cause insomnia. Post-operatively, it is difficult for patients to partake in nocturnal snacks because of the physically smaller stomach. Finally, those patients not labelled as having OSA could still have had minimal sleep disordered breathing symptoms which would not fit the diagnostic criteria for OSA, but which responds well to positive airway pressure or significant weight loss.

Bariatric surgery resulted in significant weight loss, which strongly correlated with cure or improvement (94.1%) in morbidly obese OSA patients and significantly improved sleep in all (87.9%) bariatric patients in our study. In conclusion, bariatric surgery results insignificant improvement in the quality of sleep and is a very effective treatment modality for severe sleep apnoea in the morbidly obese population. Also, the majority of patients (90.7%) who were dependent on PAP masks for many years can safely dispense with their masks within six months of surgery.

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Examining the End-User Experience of the National Integrated Medical Imaging System (NIMIS)

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Abstract
The National Integrated Medical Imaging System (NIMIS) is used to store and retrieve medical imaging studies in Ireland. The purpose of this audit was to obtain feedback from its end-users in relation to key NIMIS functionality and to understand their perception of its existing interface while identifying potential improvements. The results showed that, while the majority of respondents are satisfied with NIMIS, they identified a number of areas of concern. These included difficulty in identifying the appropriate code for a study, 88 (34%); dissatisfaction with ordering and viewing scans, 82 (32%); and a need for improved communication between end-users and local Radiology departments, with 104 (40%) unsure when to contact the department and 137 (53%) dissatisfied with the feedback they received in relation to requests. Respondents indicated that addressing these issues would improve the NIMIS end-user experience while allowing it to continue to meet current and future clinical needs.

Introduction

The implementation of electronic picture archiving and communication systems (PACS) for storing radiological images has vastly improved the quality and accessibility of such studies. The National Integrated Medical Imaging System (NIMIS) is a system for storing and retrieving medical imaging studies in Ireland comprising a national Radiology Information System (RIS) and PACS, with imaging studies stored both locally and at a central data repository. At the time of this audit, NIMIS was live in 34 sites in Ireland, with a number of further sites planned. The NIMIS RIS allows end users to order and review imaging from their current hospital site, whilst the PACS interface permits access to imaging performed across all NIMIS sites. This audit focuses on the use of the RIS system in individual hospitals on a day-to-day basis, which has not been previously analysed on a national level. To date, analysis has focused on the NIMIS rollout across the many Irish sites and there appeared to be an opportunity to examine the end-user experience of this widely used and relied upon system.

The aim of this study was to obtain direct feedback from the end-users of the NIMIS system in relation to key areas of functionality. The objective of the audit was to highlight the perceived advantages and disadvantages of NIMIS and its existing interface. A secondary aim was to gather suggestions about potential improvements directly from NIMIS users. It was hoped that in doing so, the findings could form the basis for a process of continuing end-user acceptance testing and improvement. In interpreting the results of this study it is important to be cognizant of the fact that a number of the sites utilising NIMIS do so via their own local version of RIS. This local RIS is used to access NIMIS and, in some cases, links with other local patient-centred IT systems. As such, there will be a degree of variation in the end-user experience in centres where an alternative RIS is utilised. It is also important that to bear in mind that, in looking at the McKesson RIS, the focus is on the Horizon Rad Station Distributed client. This client is the Java-based front-end utilised by the majority of users to access NIMIS. As a result the Horizon Rad Station Advanced client, more commonly used by Radiologists, does not fall within the scope of this survey.

Methods

The "NIMIS End-User Experience" survey was created using an online service provider. It addressed a number of key areas of NIMIS functionality, performance and end-user satisfaction. In order to complete the survey, a list of the 34 live NIMIS RIS sites was obtained from the system provider (McKesson). The Medical Manpower department in each of the live sites was contacted

and asked if they would be willing to send the survey to their Consultants and NCHDs. Of the 34 sites invited, 28 agreed to allow doctors employed at that site to participate. A total of 278 responses were obtained. Of these responses 16 were incomplete and two responses were duplicates. This yielded a total of 260 complete responses across various roles [Figure 1].

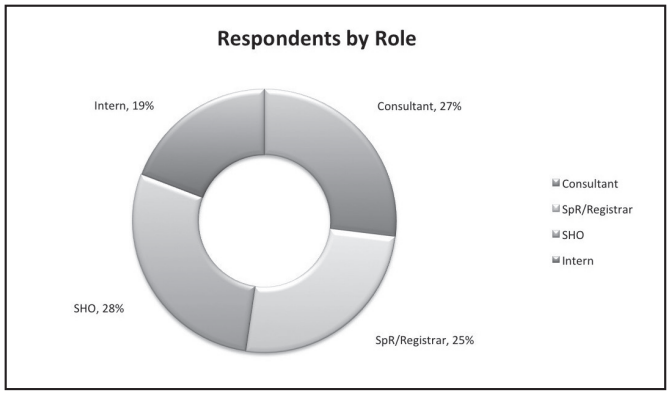

Figure 1

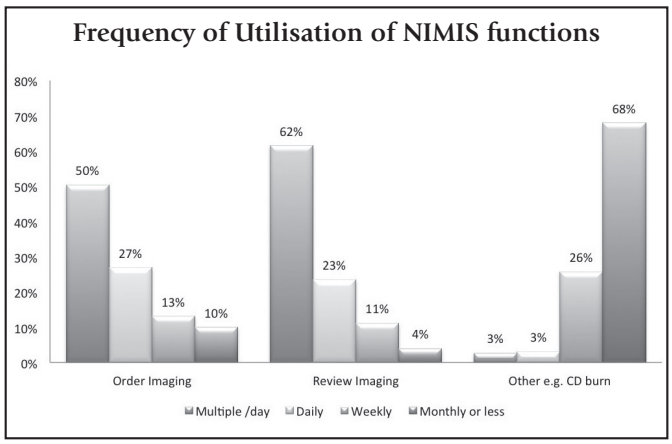

Figure 2

Results

NIMIS RIS allows users to order and review imaging for patients at their current site. The first step in gaining access to the local RIS is to obtain appropriate login credentials. Respondents were asked to indicate how long it took them to gain access to their local NIMIS. Of the 260 respondents, access was granted immediately for 51% (133) and within three days for 27% (69). A further 8% (20) obtained access within the first week while the final 15% (38) were waiting longer than a week. The survey also examined the primary NIMIS functions and the frequency with which the respondents used them [Figure 2]. In relation to both ordering and reviewing images, it was found that these functions were utilised at least once per day by 77% and 85% of respondents respectively. Of the 260 respondents, 46% utilised NIMIS solely for the purpose of ordering or reviewing imaging. The remaining 54% of respondents utilised other NIMIS functions (e.g. CD burning) but on a weekly to monthly basis at most.

The survey asked respondents to indicate their satisfaction with key NIMIS functions and in relation to communicating with the Radiology department [Figure 3]. When surveyed, 79% of respondents were satisfied with their ability to find patients' NIMIS accounts, while only 12% were dissatisfied. However 34% were dissatisfied with regards to finding the appropriate procedure code for their request, compared to 45% of users who were satisfied with performing the same task. Of the respondents, 71% felt that there was sufficient clarity when additional information was required. However, 47% of respondents were unsure when further documentation was required to support a request. The survey found that 41% of users were satisfied with completing complex tasks, while 42% were neither satisfied, nor dissatisfied. This reflects the results above which indicated that 68% of respondents rarely, if ever, use NIMIS beyond the image ordering and reviewing functions. With regard to NIMIS facilitating communications with the Radiology department, 38% of users felt that it was clear when they needed to contact the department in relation to a request. A further 40% felt that they did not know when this was necessary. The survey asked users to indicate their level of satisfaction with regards to receiving feedback on outstanding requests. Of the respondents, 27% were satisfied while 53% were dissatisfied with the feedback received.

Additionally, the survey assessed what technical support users felt was available to them and what support, if any, they would access if experiencing difficulty with NIMIS. Of the respondents, 59% felt that there was some form of technical support available to them at their NIMIS location. The survey then looked at which personnel or department users would approach with regard to NIMIS queries or support issues. This demonstrated that the most junior members of the team were more likely, at 68%, to seek

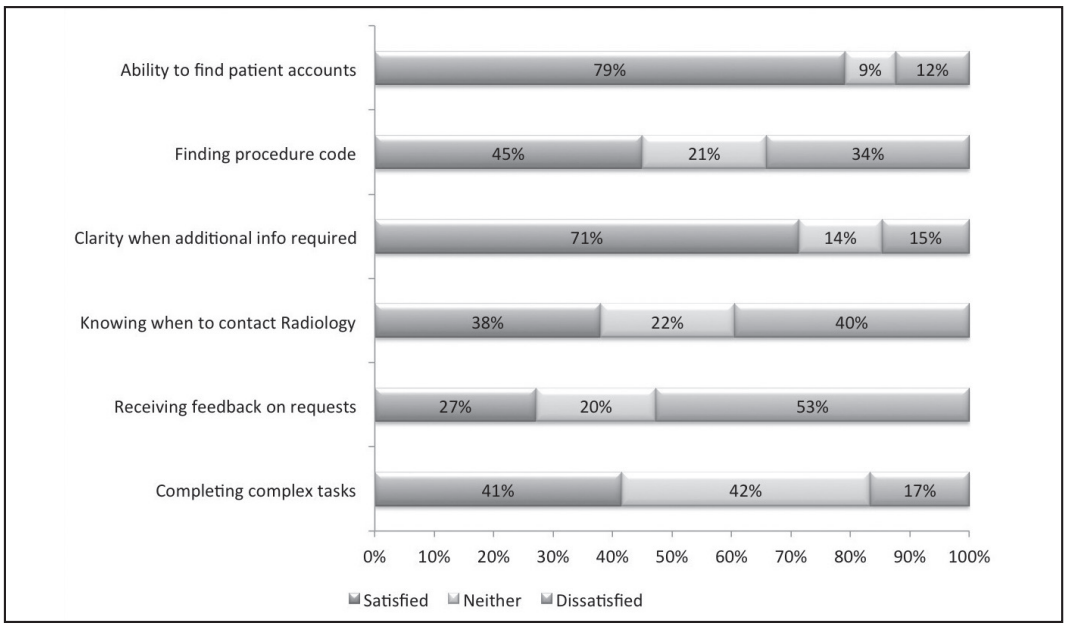

Figure 3

help from peers and senior colleagues. Conversely, they were also the least likely to avail of support from Radiology (16%) or the PACS Office/Technical support (18%). It was noted that these trends reversed with increasing seniority. As a result, 17% of Consultants indicated that they would seek help from peers or junior colleagues while this same group was increasingly likely to seek help directly from Radiology (23%) or from PACS Office/ Technical support (35%).

Finally, the survey allowed users to provide free-form feedback, comments and suggestions regarding their end-user experience of NIMIS. Overall there was a mixed response among those surveyed about their end-user experience of NIMIS although most respondents were keen to see NIMIS utilised by more clinical sites in order to promote clinical collaboration between institutions. Furthermore, respondents were generally very pleased with the existing PACS functionality. Many respondents felt that integrating RIS and PACS into a single system would be of great clinical benefit. Many respondents, while happy with overall functionality, indicated that areas exist in which the design and functionality of NIMIS could be improved. Additionally many felt that there is a need for NIMIS to support improved communication between end-users and Radiologists in relation to outstanding requests. With regard to IT and infrastructure, respondents expressed concerns over the suitability of current hardware and the supporting network to allow efficient use of NIMIS. NIMIS RIS is a web-based application and hence most of the performance limitations would appear to be due to network latency and bandwidth. The respondents have suggested that improvements in IT and infrastructure would greatly decrease the time taken to order or review imaging. Patient records on NIMIS are accessed using a Medical Record Number (MRN) specific to the current site. The patient record allows the user to place new orders or review existing imaging and reports completed at that site. The respondents identified a need for a unique NIMIS identifier for patients to eliminate the need to manually search for a specific patient on PACS.

Imaging is ordered via the RIS patient record and an inpatient; outpatient or Consultant-specific account for that patient must then be selected. The survey has highlighted concerns regarding these accounts. Many respondents felt that a scan could be ordered on the wrong account and would subsequently be rejected. Additionally, a "ward attender" must be created in order to allow an outpatient scan to be booked for a patient under a specified Consultant. Most RIS users do not have permission to create a "ward attender" and this can delay ordering follow-up imaging for patients on discharge from hospital. Furthermore, respondents have suggested that allowing users to access both the ordering function and reviewing function simultaneously would increase end-user satisfaction and allow for more efficient use of NIMIS. The respondents also indicated that, when placing orders, they have experienced difficulty in finding the correct procedure code and felt that supporting documentation detailing procedure codes would be of benefit here. Respondents have highlighted issues with communications between end-users and their local Radiology department regarding outstanding NIMIS requests and their scheduling. Presently, there is no facility in RIS to alert users if a request has been rejected or if further information is required. It was suggested that a list of the user's recent requests and their approval status, accessible via RIS, would be of great benefit. This would prevent the cancellation of requests, particularly those in the outpatient setting, without the user being alerted. Similarly, respondents indicated that a facility to sign reports to indicate that they have been reviewed and/or actioned could reduce workload in terms of Radiology department follow up.

Discussion

The NIMIS RIS is a web-based application allowing users to request and review local imaging studies. It is accessed via desktop computers by using a unique username and password. The introduction of NIMIS has facilitated the transition from a local, hard copy imaging service to one that is transferrable and easily accessible. It promotes collaboration between institutions and allows remote access to imaging in the acute setting. As with the introduction of any such system, there is a need for an iterative approach to continued improvement and user acceptance testing to ensure that the system continues to evolve in line with changing clinical demands. Overall the survey has reflected, as discussed in the "Results" section, the fact that many respondents are satisfied with the overall NIMIS functionality and feel that it helps to reduce clinician workload. It has been seen as a "step in the right direction." However the survey has highlighted issues that need to be addressed, in collaboration with end-users, in order to improve functionality while promoting patient safety. These improvements relate to improving IT infrastructure; increased clarity regarding patient records and accounts; simplified image ordering; and the continued improvement of communication between end-users and local Radiology departments. In addition, performance issues within RIS need to be addressed. Implementing such changes and ensuring an ongoing process for end-user involvement would ensure that NIMIS continues to meet current and future clinical needs to the highest standard.

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Standards in Operation Notes – Is It Time to Re-Emphasise Their Importance?

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Abstract
Guidelines exist for operation notes from the Royal College of Surgeons of England but compliance has been shown to be variable. The authors performed a closed loop audit of compliance with RCS standards in an Irish Plastic Surgery department. Thirty random operation notes were selected from a conserved pool of authors - before and after an educational intervention to increase awareness of the RCS guidelines. Following education, improvements were noted but also deteriorations – time increased from 12 (40%) to 16 (53%), emergency/elective status from none (0%) to 11 (36%), and operative diagnosis from seven (23%) to 21 (70%). However notably among the findings, surgeon's name decreased from 30 (100%) to 26 (86%), findings from 27 (90%) to 21 (53%) and tissue altered from 27 (90%) to 20 (66%). As some specialities are developing operation note standards specific to individual procedures, the findings are compared with previous similar published work.

Introduction

The importance of clear and complete operation notes cannot be disputed. A full and accurate operation note allows the seamless transfer of care from the operating room to the recovery area and beyond. Furthermore, as health systems across Europe embrace the European Working Time Directive, the need has never been greater for enhanced transfer of patient related information between medical practitioners – a greater implementation of shift work will mean that patients in the immediate post-operative phase will be cared for by doctors who were not directly involved in the surgical procedure. In addition, these notes are medico-legally important - should a court case arise from a patient's episode of care, the operation note would form an important part of the legal documentation. Guidelines already exist for the preparation of operation notes. In 2008, the Royal College of Surgeons (RCS) in England updated their Good Surgical Practice (GSP) guidelines. As well as containing guidance and standards for good clinical care, teaching and training, relationships with colleagues and patients, and probity and health, this document laid out specific criteria to be included in operation notes – these are reproduced in Table 1. The GSP explicitly state that medical notes should "allow another doctor to assess the care of the patient at any time"[1]. It should go without saying that the operation note would be a key part of this assessment. There exists no comparably explicit document in Ireland. A Health Service Executive (HSE) document entitled "Standards and Recommended Practises for Healthcare Records Management" was published in 2011[2]. This relates to the physical condition and maintenance of patient notes and there are specific recommendations about the time and date, the name and signature of the doctor making the entry and a bleep/identification (e.g. Irish Medical Council registration number) etc. The authors carried out an audit of their department's practice relating to the writing of operation notes – specifically if the RCS guidelines are being upheld. This audit included an educational component to ascertain if any lack of adherence to the guidelines in our department was a result of ignorance or omission.

Methods

A retrospective review was carried out on thirty operation notes selected at random from the Department of Plastic Surgery in Galway University Hospital. Operation notes are handwritten into the patient's medical notes following the procedure by a member of the surgical team. All operations were performed in the previous month. The notes were reviewed by the first author (KC) and their compliance with the 15 data points recommended in the RCS GSP guidelines was recorded. This was followed by an educational intervention – at a departmental meeting the results were presented and the GSP and HSE guidelines described. In addition to this, notices were placed in every location where our team regularly operate outlining the specific guidelines. Thereafter, a further review of 30 operation notes written in the calendar month following the intervention was performed. All notes were written by the same pool of authors who had contributed to the first selection. All authors attended the education presentation.

Table 1: Good Surgical Practice Operation Note Data Points

- Date and time
- Elective or emergency
- Names of surgeon & assistants
- Incision
- Operative diagnosis
- Operative findings
- Any problems/complications
- Any extra procedure, and reason for it
- Detail of tissue removed, added or altered
- Identification of any prosthesis used
- Details of closure technique
- Post operative care instructions
- Signature

Table 2: Percentage compliance with GSP guideline points

Audit Point	First Audit	Second Audit
Emergency/Elective	0	36
Operative Diagnosis	23	70
Time	40	53
Operative Procedure	100	100
Closure	100	100
Signature	97	97
Date	100	97
Post Op Plan	100	97
Incision	90	86
Names of Surgeons(s)	100	86
Operative Findings	66	53
Tissue Altered	90	66
Complications	n/a	n/a
Extra Procedures	n/a	n/a
Prostheses	n/a	n/a

Results

In both review periods the case mix and author grade were broadly similar – in the first there were 11 emergency procedures and 19 elective operations while in the second there were nine of the former and 21 of the latter. The breakdowns of authors were as follows; first survey: three consultant, 23 registrar/SpR (ST3+), two SHO (CT2+), and in the second survey; four consultant, 21 registrar/SpR, and five SHO. In the first survey there were a number of shortcomings identified. Following the presentation of these results to the author pool, the dissemination of the GSP standards and the placement of aide-mémoires in key areas, some small improvements were noted however other criteria showed little improvement. These findings are reproduced in Table 2. Of note, there was one note with no documented post-operative plan, and in both data sets there was one operation note that was not signed (3%).

While it should be borne in mind that these findings are based on a relatively small sample set, it is a robust one. The data is drawn from a conserved pool of authors, all of whom were exposed to the education intervention. However, there is a potential for a bias in the data, so the results were reconsidered on a "per author basis". The authors considered that three of the standards were not relevant to the operation notes reviewed – namely complications, extra procedures, and prostheses. Omitting these, there remain 12 data points to be entered in each note. Taking that each separate author (12 in total) should enter these 12 points for each note written, we can generate a percentage compliance for each author. This is reproduced in Figure 1. As can be seen, only one of the 12 reached 100% compliance with the rest falling between 65% and 87%. There may however be a way to track operation note author compliance with the aim of improving operation note standards. If the four worst "performing" points in the first survey (time, emergency/elective, operative diagnosis, findings) are taken in isolation for the purposes of ascertaining author compliance in the second survey then a further graph can be generated to determine author concordance with the aim of promoting adherence with the GSP guidelines. This is reproduced in Figure 2.

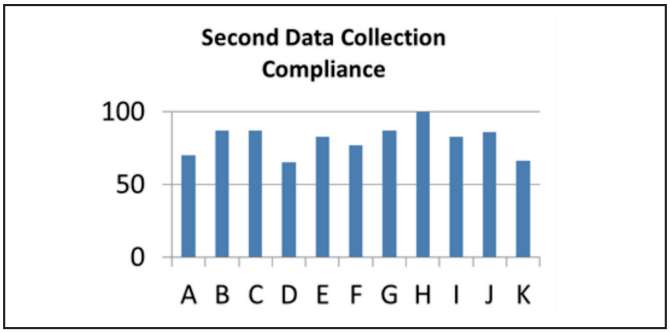

Figure 1

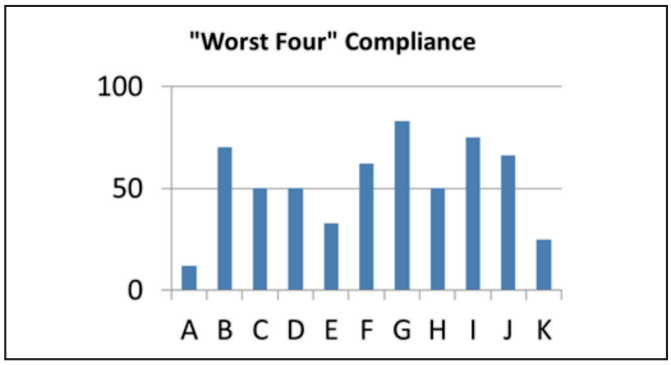

Figure 2

It can be seen that author "A" had the lowest compliance, and on review of the operation notes it was seen that this author had written six of the 30 notes randomly selected for review in the second survey. While this could be viewed as a confounder for the data, it also raised the interesting point that we cannot expect compliance with guidelines as a given, regardless of the relative importance of each point. We must educate our peers and juniors about the importance of robust documentation, and hope that they do not later gain this appreciation through a negative experience of the consequences of poor documentation.

Discussion

There have been a number of publications looking at the implementation of the RCS GSP guidelines into surgical practice[3-6]. These have shown that the compliance across a number of specialities is variable. This may in part reflect that the guidelines are not directly applicable to these specialities. Indeed, in plastic surgery, a sizeable proportion of procedures would have as their primary aim the "alteration of tissue" and therefore it may seem moot to the authors to include a specific reference to this. This point can be equally applicable to cases involving the excision of skin and soft tissue lesions – when this information is implicit in the procedure, many surgeons will not include it separately in the documentation. Previous published work in this area bears this out – Rogers et al performed an audit of over 280 operation notes before and after an educational intervention similar to that set out here[7]. In their cohort of "post education" operation notes, 19.2% of the operative surgeons felt that the diagnosis did not need to be included as a separate heading in the documentation, and 56.9% felt the same for tissue altered/added. Almost all of the surgeons in this group marked the "prosthesis" sub-heading as not applicable and we would agree that this is often the case and excluded it for analysis in our group. This variety in criteria needing to be recorded in our operation notes presents a challenge for a pan-speciality, pan-procedure checklist.

The British Orthopaedic Association have a specific operation note for primary hip arthroplasty[8], and the Dutch Association of Hepatic Surgeons have a checklist for documenting the required steps in laparoscopic cholecystectomy[9]. With this in mind, is it possible to have a unified standard for operation notes, given the near infinite variation in surgical procedures that are performed across the specialities? Many of the previously published works in this area emphasise the importance of education in achieving compliance with operation note standards. However, we have shown here that merely didactically raising awareness of a standard may not automatically lead to its acceptance. This may reflect the non-applicability of the blanket standard as outlined above, the pragmatism and individuality of surgeons as a group, or simply a resistance to external pressure to change. It is difficult to relate patient outcomes directly to the quality of operation notes. However the National Confidential Enquiry into Peri-Operative Mortality (NCEPOD) in the United Kingdom did highlight a "considerable variation in operation notes, and..... an urgent need to improve medical notes"[6]. One method that may prove fruitful is the development of electronic operation notes. These involve two formats. The first is a word processor document available on a computer in theatre that is populated with "drop-down" boxes. These require the input of data points as the note is commenced, with a free text box for any additional or specific information at the author's discretion. The resultant note can be printed, signed and filed in the medical notes. Such a format was trialled by Ghani et al in a recent published audit – they were able to markedly improve the content of operative records with the introduction of a macro enabled word processor document that was author generated[10].

However, the wide range of operative procedures in each surgical sub-speciality perform may hinder implementation – it may require such a large number of options in the "drop-down" menu as to be unworkable. Instead, perhaps surgeons could write an "ideal" operation note for a number of their most commonly performed elective procedures and then tailor it to the operation at hand. The other alternative is an electronic theatre management system, which is a part of the patient's pathway through theatre. It requires the completion of an electronic note, again with a number of required fields. This could generate an operation note that is printed, signed and filed. The downside of these two options is the requirement for a functioning computer and printer, with the attendant costs of purchase and maintenance. Perhaps, as health systems evolve and move to a paperless state, the entirely electronic patient record will become a reality and compliance with a range of medical note keeping will be automatic.

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In-hospital Cardiac Arrest at Cork University Hospital

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Abstract
We describe the incidence and outcomes of in-hospital cardiac arrest (IHCA) at Cork University Hospital over a one year time period (2011), prior to the implementation of national early warning scoring (NEWS) systems. There were 43 217 coded CUH admissions, in 2011, to 518 in-patient beds. The Hospital In-Patient Enquiry Database was used to identify adults (>/= 18 years) who sustained IHCA. Available Utstein variables were collected. Fifty-two patients were found to be incorrectly coded IHCA. 17 of 63 (27.0%) IHCA survived to discharge. IHCA with shockable rhythm had significantly higher survival. IHCA survival was significantly lower on wards versus any other hospital location. Median days of stay prior to arrest were significantly different between survivors and non-survivors. All survivors (n=17) had intact neurological outcome post-event. Our outcomes from IHCA are poorest on hospital wards when compared to other areas of the hospital. Those that survive have excellent function and one-year survival.

Introduction

A cardiac arrest is a sentinel event in healthcare. Cardiopulmonary resuscitation[1], since the late-1950s[2], has been a standard of care for these patients. However, the success rate of this treatment protocol remains dismal, and the progress stagnant[3]. Focus on improving cardiac arrest outcomes through an auditing culture has resulted in the development of the Utstein template[4] for cardiac arrest. This template has provided a scaffold for the United States' collaborative cardiac arrest registry, known as Get With the Guidelines Registry (GWTG-R)[5]; as well as the more recently developed National Cardiac Arrest Audit (NCAA) initiative among hospitals in the UK and Ireland [6]. Factors surrounding in-hospital cardiac arrest incidence and outcome can highlight general aspects of hospital vigilance, system responsiveness and efficacy. This study describes the incidence and outcomes of in-hospital cardiac arrest at Cork University Hospital, for a one year time period (2011). This establishes a baseline prior to the implementation of national early warning scoring (NEWS) systems, designed to improve clinical vigilance for the deteriorating patient.

Methods

Cork University Hospital (CUH) provides tertiary services to a population of over 1.2 million people. In 2011, the number of acute in-patient beds was 518; 44 029 in-patients were treated (with 43 217 coded admissions), and there were 584 in-patient deaths. Our collection of patient information from hospital and general practice records was approved by the Clinical Research Ethics Committee (CREC). Our definition of "In-hospital Cardiac Arrest (IHCA)" is restricted only to patients who occupied a hospital bed in CUH at time of cardiac arrest, who were at least 18 years old; who did not have a do not attempt resuscitation (DNAR) order documented. All adult hospital areas were included in this study. A "cardiac arrest", per the Utstein-style definition 4 is 'the cessation of cardiac mechanical activity [which is] confirmed by the absence of a detectable pulse, unresponsiveness and apnoea (or agonal respirations)'. A "return of spontaneous circulation (ROSC)", refers to patients in whom a pulse was returned, which resulted in a successful completion of CPR. This definition excluded situations with brief returns of pulse during on-going CPR. We calculated cardiac arrest incidence by dividing the number of patients with IHCA, by the number of patients admitted to the hospital that year, (per 1000 admissions). In patients who experienced multiple arrests, the IHCA number includes only the index arrest.

"Resuscitation" was defined as the use of chest compressions and rescue breathing. "Advanced life support"[7] measures include invasive airway management, chest compression, drugs administration or defibrillation, with an automated external defibrillator (AED). An "in-hours arrest" refers to an IHCA that occurs Monday to Friday between 09:00 and 16:59; an "out-of-hours" arrest refers to an IHCA that occurs Monday to Friday between 17:00 and 08:59, or any time on a Saturday or Sunday. A "survivor" is any IHCA patient who survived to hospital discharge, after cardiac arrest. "Survival rate" was determined by dividing the number of survivors, by the total IHCA number. "Neurological outcome" was established by calculating the Cerebral Performance Category (CPC) Score[7] of that patient at discharge, 6, and 12 months. A "shockable" rhythm refers to ventricular fibrillation, or pulseless ventricular tachycardia (VF or VT); and an "unshockable" rhythm refers to both pulseless electrical activity and asystole. The Hospital In-Patient Enquiry (HIPE) Reporting Database was used to identify eligible patients. Adult (>/= 18 years) in patient cardiac arrest events which occurred from January 1st 2011 through the 31st of December 2011 were included. Figure 1 illustrates chart inclusion criteria.

Cork University Hospital operates to ACLS (advanced cardiac life support) Guidelines[8]. Physicians are expected to maintain up to date ACLS certification, likewise are Emergency, Intensive Care and Cardiac Care nurses. AEDs can be found on all general wards, as well as in the emergency department (ED), intensive care unit (ICU), cardiac care unit (CCU) and cardiac catheterisation laboratory (cath lab), with all staff trained in their use, irrespective of life support qualification level. Resuscitation equipment is standardised and located on every ward or unit; and within that area, is positioned nearest the highest dependency beds of that area. Cardiac arrest variables which were retrievable and obtained from patient chart included: age; sex; arrest location, time of day, day and month; if the cardiac arrest was witnessed and/or monitored; length of arrest episode; initial rhythm, length of stay prior to event; do-not allow resuscitation (DNAR) status of the patients, rate of ROSC; and likely aetiology. In cases where length of resuscitation was not explicitly charted, data could often be extrapolated via number of CPR rounds (assumed to have two minute intervals).

Outcome data included survival rate, neurological disposition (CPC score) and functional independence of survivors (activities of daily living independence). Outcome data was obtained through the patient's hospital notes, or via telephone contact with the patient's General Practitioner. All data was manually entered into a computer database (Microsoft Excel 2003, Microsoft Corporation, Mountain View, CA USA). All statistical analyses were conducted using R Version 2.6.0 (Free Software Foundation, Boston, MA). Descriptive statistics were used to describe data. Logistic regression was used to analyse ROSC and survival associations, as well as complex abnormally distributed variables.

Results

HIPE identified 115 coded in-hospital cardiac arrest cases. These charts were retrieved and reviewed (Figure 1). There were 63 cases which met IHCA criteria. There were n=46/63 (73.0%) patients who achieved ROSC, n=21/63 (33.3%) who achieved

CPD available online at www.imj.ie and questions on page 351.

a ROSC of greater than 20 minutes, and n=17/63 (27.0%) survived to be discharged from hospital alive (Table 1).

Location

Cardiac arrest outcomes differed on the hospital wards compared to other areas of the hospital, with ROSC rates of 12/22 (54.5%) versus 34/41 (82.9%), p=0.03; and survival rates 1/22 (4.5%) versus 16/41 (39.0%), p=0.01, respectively, (see also Table 2). Compared to a witnessing rate of n=55/63 (87.3%) among all IHCA, only n=44/63 (71.4%) of the ward-based cardiac arrests were witnessed. Within the emergency department (ED), n=6/15 (40.0%) cardiac arrests had a primarily cardiac aetiology, whereas only n=3/22 (13.6%) of those which took place on the ward had a primarily cardiac aetiology.

Length of Stay Prior to Arrest

There were n=24/63 (38.1%) of IHCA patients who had their cardiac arrest on day-one of admission, with, n=11/24 (45.8%), survivors, in that category. Of those IHCA patients who had their cardiac arrest after day-one of their admission, n=6/39 (15.4%) survived. There were two cardiac arrests (n=2/15, 13.3%) that occurred in the ED > 24 hours after registration while the patients were boarded awaiting an inpatient bed. Only (n=1/22, 4.5%) of ward-based cardiac arrests happened on day-one of admission.

Of all IHCA patients who had a cardiac arrest on day-one of admission, n=13/24 (54.1%) were shockable. IHCA patients who had a cardiac arrest after day-one of admission, were only shockable in n=6/39 (15.4%) of cases. Length of stay prior to arrest was significantly different between a shockable and unshockable rhythm (p=0.002), and also between survivors and non-survivors, by logistic regression (p=0.01). The single ward survivor arrested on day 22 of admission. Median days of stay prior to arrest were significantly different between shockable (0 days) and unshockable rhythm (4.5 days), p-value < 0.002; and also between survivors (0 days) and non-survivors, (4.0 days), p-value < 0.01, respectively.

Arrest Characteristics

Of unshockable IHCAs, n=8/44 (18.2%) subsequently converted to a shockable rhythm later in the resuscitation, and conversely, n=3/19 (15.8%) of shockable IHCAs went on to become unshockable rhythms. Day and month of arrest are influential on survival and ROSC, respectively, however time of arrest was not significantly associated with either. See Figure 2 for outcomes per survival rhythm. Survivors had more arrests on their first day of admission, n=11/17 (64.7%), than non-survivors, n=13/46 (28.3%), p=0.02.

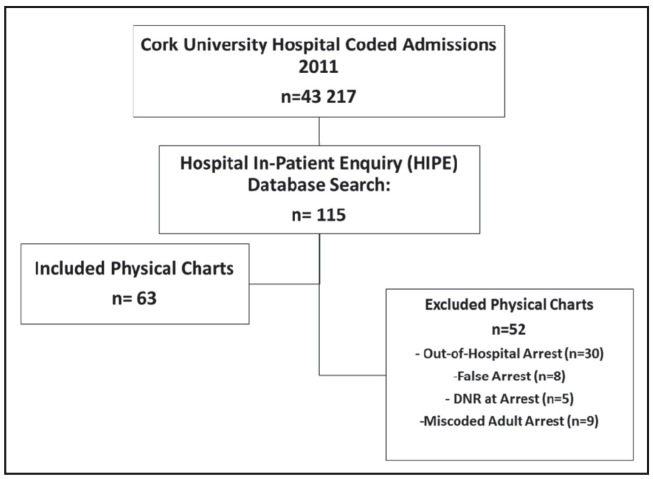

Figure 1. Chart Stratification

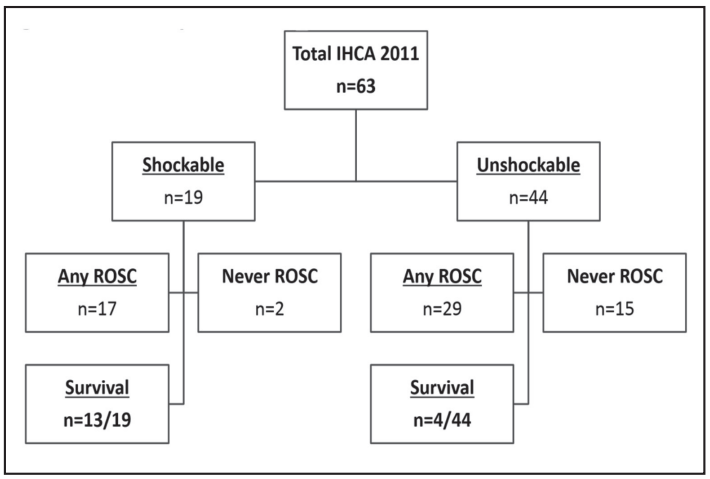

Figure 2. Survival per arrest rhythm

Table 1 Baseline Characteristics of All IHCA

		IHCA	ROSC	Survivors	P-value
Age	Median years (IQR)	74.3 years	73.2 years	66.6 years ±	<0.05 ±
Sex					
Male	N (%)	40 (63.4%)	29 (72.5%)	10 (25.0%)	
Female		23 (36.5%)	17 (74.0%)	7 (30.4%)	
Aetiology					
Cardiac	N (%)	28(44.4%)	23 (82.1%)	11 (39.3%)	
Metabolic/Other		16 (25.4%)	10 (62.5%)	4 (25.0%)	
Respiratory		6 (9.5%)	3 (50.0%)	1 (16.6%)	
Septic		6 (9.5%)	5 (83.3%)	0 (0.0%)	
Gastrointestinal		3 (4.8%)	1 (33.3%)	0 (0.0%)	
Neurologic		3 (4.8%)	3 (100.0%)	1 (33.3%)	
Unclear		1 (1.6%)	1 (100.0%)	0 (0.0%)	
Arrest Rhythm					
Shockable	N (%)	19 (30.2%)	17 (89.5%)	13 (68.4%)*	<0.001*
Unshockable		44 (69.8%)	29 (65.9%)	4 (9.1%)	
Witnessed					
Witnessed	N (%)	55 (87.3%)	44 (80%)**	17 (30.9%)	<0.005**
Not Witnessed		8 (12.7%)	2 (25.0%)	0 (0.0%)	
Monitored					
Monitored	N (%)	38 (60.3%)	33 (86.8%)***	14 (36.8%)	<0.006***
Not Monitored		25 (39.7%)	13 (52.0%)	3 (12.0%)	

± = significantly lower age in survivors versus non survivors
* = significantly higher rate of shockable rhythm (versus unshockable rhythm) in survivors
** = significantly higher rate of witnessed (versus unwitnessed) IHCA in patients who had ROSC
*** = significantly higher rate of monitored (versus unmonitored) IHCA in paitents who had ROSC

Table 2 Survival by patient location and time of arrest

		All IHCA	Any ROSC	Survived	P-value
Location					<0.01*
ED	N (%)	15 (23.8%)	14 (93.3%)	7 (46.7%)	
Cath lab		11 (17.5%)	8 (72.7%)	5 (45.5%)	
ICU/CCU		7 (11.1%)	5 (71.4%)	1 (14.3%)	
Ward		22 (34.9%)	12 (54.5%)	1 (4.5%)*	
Other ±		8 (12.7%)	7 (87.5%)	3 (37.5%)	
Time of Arrest					
In-Hours Arrest	N (%)	26 (41.0%)	21 (80.8%)	8 (30.7%)	
Out-of-Hours Arrest		37 (59.0%)	25 (67.6%)	9 (24.3%)	

± Other = operating theatre, radiology, interventional procedure, endoscopy, transport
* = significantly lower survival rate on the ward versus other locations

Length of Resuscitation
Resuscitation lasted less than 10 minutes in, n=37/63 (58.7%), of IHCA cases. In those that achieved ROSC, n=30/41 (73.2%), did so within 10 minutes. The median length of resuscitation lasted 5 minutes in survivors, which was significantly shorter than the median of 15 minutes, in patients who did not survive, p-value = 0.015.

Survivor Outcome
All survivors, (n=17), had a CPC score of one, post-arrest. One patient was subsequently lost to follow up. The remainder of survivors, (n=16/17), lived to at least 12 months post-arrest. There were three survivors who experienced a deterioration in their functional independence for activities of daily living.

Discussion

This is the first Irish report of in-hospital arrest data that has been contextualised by the manual review of patient notes. This approach was crucial, as nearly half of our initially defined study denominator subsequently did not satisfy the definition of an in-hospital cardiac arrest per the Utstein criteria 4, following this chart analysis. Our cardiac arrest incidence and survival rate was shown to be comparable to international standard[9,10]. Our survivors' neurological outcomes approached 100%, and this correlated with excellent functional outcomes. Our cohort's good outcome is somewhat unique in cardiac arrest literature, with a preservation of neurological function in less than 80% of cases[11-13], typically. Survival at the ward level was lower than that seen in all other hospital locations (Table 2). The poorer outcomes seen in ward-based IHCA, seem related to prognostic favorability of a shockable rhythm, which we found to be less likely in a long-stay patient's IHCA. We found that length of resuscitation was significantly shorter among survivors versus non-survivors, which is an established phenomenon[4]. Although our survival rate was excellent, the duration of our resuscitation attempts was shorter (in some cases) than some literature would advise[15].

The issues of decreased observation, dilution of expertise, and de-escalated patient monitoring seen in ward care are a focus of the newly implemented NEWS system, as monitored and witnessed arrests are more likely to survive[14]. This new approach[16] aims to identify physiologic deteriorations and allow early interventions. This has been shown to alter outcomes[17]. It is clear that IHCA context is different when occurring early versus later in a hospital admission. An acutely blocked coronary artery leading to an ischemic cardiac arrest is more likely to result in a shockable rhythm (a survival advantage)[5], whereas a brewing septic milleu is more likely to lead to PEA or asystole[14,18], with poor survival[5]. Recognition of change in clinical context could optimise survival. Since only the minority of cardiac arrests are survivable, prevention is a crucial goal, and it is hoped NEWS will facilitate an early recognition of disease progression, and prevention of deterioration toward cardiac arrest.

Not all Utstein variables were available for this study, due to documentation limitations. In the case of timing-based variables, such as time-to-defibrillation (in shockable rhythms)[19], or time to arrival of cardiac arrest team[20], values may be prognostic and can significantly influence outcome in IHCA. Length of resuscitation attempts were inconsistently reported. Sample size limited significance for some key Utstein variables. Our outcomes from IHCA are poorest on hospital wards when compared to other areas of the hospital. Those that survive have good functional and one year survival rates.

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The Value of the Combined Assessment of COPD in Accurate Characterization of Stable COPD

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Abstract
There is evidence showing a tendency to upgrade COPD severity previously staged with spirometric-based GOLD (GOLD 1234) when using the new GOLD combined disease assessment (GOLD ABCD).[1,2] The aim of our study was to compare the GOLD 1234 classification in a population of stable COPD patients with the GOLD ABCD classification to determine whether stable COPD was upgraded when using this new classification. After an observational study of a stable COPD cohort (n=112), 61 patients (54.5%) had an increase in their COPD severity when moving from the old GOLD 1234 classification to the current GOLD ABCD assessment ($p<0.01$). 42 patients (37.5%) had no change in severity of COPD. 9 patients COPD were assessed to be better on using GOLD ABCD. This study highlights previously missed high-risk patients when reviewing stable COPD. Continued incorporation of GOLD ABCD will translate into better evidence-based management.

Introduction

In 1997, the Global Initiative for Chronic Obstructive Lung Disease (GOLD) was first launched in conjunction with the National Heart, Lung, and Blood Institute (subsidiary of National Institute of Health, USA) and WHO.[3] The first guidelines for COPD management was released in 2001, where severity of COPD (Stage 0,1,2,3) was based on spirometric measurements of airflow obstruction, specifically the FEV1 or the forced expired volume in the first second of a forced exhaled maneuver.[3] It included a Stage 0 i.e. At risk patients; who were respiratory patients who complained of chronic cough and sputum production but had normal spirometry. The rationale was that COPD progressed through a path of accelerated airway obstruction over time as measured by the FEV1. It has always been recognized however that there is disconnect between the single biomarker FEV1 and symptoms i.e. dyspnea; and exacerbation risk, however, the use of FEV1 was useful in the process of standardization of our understanding of COPD.[3-5] This spirometric-based classification will be known as GOLD 1234 for this study. In 2011 GOLD revised the spirometric-based staging to include a combined assessment of the disease whose most recent update is 2014[6] (see Table 1).

This incorporated patients' level of symptoms and future risk of exacerbations along with FEV1. COPD is now graded A, B, C, D. Two previously validated tools, the modified Medical Research Questionnaire (mMRC) and the COPD assessment test (CAT) were integrated to assess patient's level of symptoms. The current/revised criteria will be henceforth being referred to as GOLD ABCD. The format of treatment is almost identical to GOLD 1234 with a stepwise increase in pharmacotherapy as patients' grade of COPD worsens. There has been evidence showing a tendency to upgrade patients previously staged with older version of GOLD when using the new GOLD ABCD. The aim of our study was to compare the GOLD 1234 classification in a population of stable COPD patients with the novel GOLD ABCD classification to determine whether chronic COPD was upgraded when using this new classification. We reasoned that significant upgrading would more accurately reflect the burden of disease and better inform targeted interventions.

Methods

A cross-sectional observational study was carried out using patients with stable COPD attending a Dublin teaching hospital adult respiratory centre. Authors classified patients into GOLD 1234 and GOLD ABCD during the same review. Symptoms of breathlessness and history of acute exacerbations of COPD were recorded during the initial clinic consultation. Breathlessness resulting from COPD was graded using the modified Medical Research Council (mMRC) questionnaire. Exacerbations were defined as an increase in self-reported respiratory symptoms from baseline, deemed to require additional medication e.g. antibiotics or steroids. All patients' FEV1 post bronchodilator and FEV1/FVC ratio was recorded. A ratio < 0.70 was required in all subjects to validate the presence of airflow obstruction. The new COPD 2014 classification was then used to group the patients into four groups; Group A (low risk with fewer symptoms), Group

B (low risk with more symptoms), Group C (high risk with fewer symptoms) and Group D (high risk with more symptoms). Low or high risk was decided by a combined assessment of spirometry and history of exacerbations.

History of exacerbations was defined as a number of acute exacerbations in the 12 months preceding the study based on GP correspondence and clinical history. Fewer symptoms were defined as mMRC grade 0-1, with more symptoms defined as mMRC grade 2 or more. This was then correlated with the original COPD GOLD 1234 classification based on post-bronchodilator FEV1 alone. This was based on an assumption that COPD disease severity using GOLD 1234 should correlate directly to GOLD ABCD e.g. GOLD 1 = GOLD A, GOLD 2 = GOLD B, GOLD 3 = GOLD C, and GOLD 4 = GOLD D. A paired samples t-test (SPSS v22.) was conducted to evaluate the change in COPD grade between the GOLD 1234 and new GOLD ABCD classification if A=1, B=2 etc.

Table 1: Difference between GOLD 1234 and GOLD ABCD classification

	GOLD 1234	GOLD ABCD
Year of introduction	2007	2011
Number of variables	1	4
Variables:		
Degree of airflow limitation (FEV1)	Yes	Yes
Assessment of respiratory symptoms	No	Yes
Assessment of number of exacerbations	No	Yes
Assessment of future risk of exacerbations	No	Yes
Classification system	Stage 1,2,3,4	Grade A,B,C,D

Table 2: Baseline demographics and clinical characteristics (n=112)

Age years		65.3 ± 9.56
Male/Female		58/54
Smoking History	Ex smokers	58
	Current Smokers	31
	Non Smokers	23
Severity of dyspnoea (using mMRC)	Grade 0	21
	Grade 1	35
	Grade 2	18
	Grade 3	24
	Grade 4	13
Annual exacerbations		2.5 ± 2.2

Results

One hundred and twelve patients with stable COPD were recruited from an adult respiratory centre. Table 1 shows their baseline demographics and clinical characteristics. The average age of patients in this study was 65.3 years (58 males, 54 females). 23 patients (20.5%) in this study declared themselves lifelong non-smokers, which suggest that passive smoking or occupational exposure to tobacco smoke is still a burden in Irish healthcare. Figures 1 and Table 3 show the change in severity of stable COPD patients when moving from the old GOLD 1234 classification (spirometric based) to the new GOLD ABCD classification. 0 indicates no difference when using both GOLD classifications i.e. GOLD 0 = GOLD A or GOLD 3 = GOLD C. Forty two patients (37.5%) had no change in severity of COPD when comparing both the GOLD 1234 and GOLD ABCD guidelines. +1 indicates COPD severity increased by 1 GOLD category when using the new GOLD classification (e.g. GOLD 2 to GOLD C).

Twenty five patients (22%) showed a 1-category increase in this study. +2 would indicate severity increased by 2 categories when moving from GOLD 1234 to GOLD ABCD e.g. GOLD 2 to GOLD D or GOLD 1 to GOLD C. 27 patients (24%) showed a 2-point increase in COPD severity in our study. +3 indicates COPD severity increased by 3 categories (GOLD 1 to GOLD D). 9 patients (8%) showed a 3-category increase in severity. -1 indicates severity improved by 1 GOLD category (e.g. GOLD 2 to GOLD A). 9 (8%) patients' COPD improved in severity when using the GOLD ABCD guidelines. The similarity in FEV1=50% as a discriminator of severity in both GOLD 1234 and GOLD ABCD meant that it was impossible for a patient to have more than 1 category improvement. Of the total cohort, 61 patients (54.5%) had an increase in their COPD severity when moving from the old GOLD 1234 assessment to the current GOLD ABCD assessment. This was noted to be a statistically significant increase in patients COPD severity (p=<0.01, t=8.3, df=0.11).

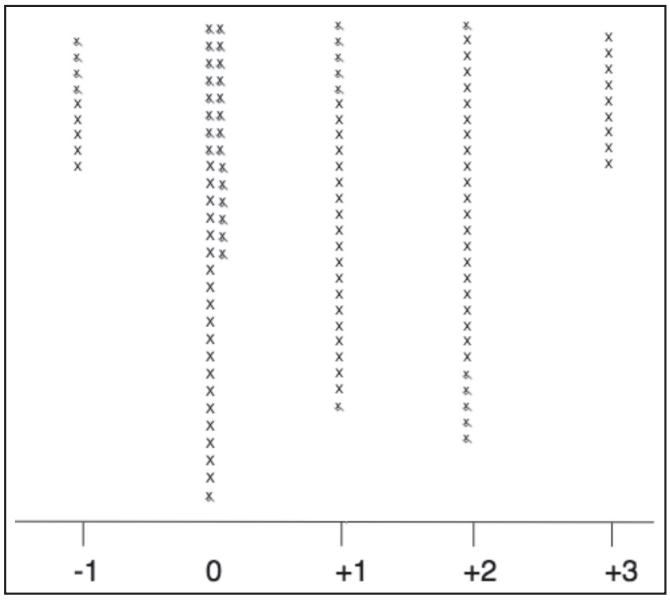

Figure 1: Difference in assessing the severity of stable COPD patients when moving from GOLD 1234 (spirometric based) to the new combined assessment i.e. GOLD ABCD classification

0 indicates no difference when using both GOLD classifications. +1,+2,+3 indicates severity increased by 1, 2, and 3 categories when using the new GOLD classification (E.g. GOLD 2 to GOLD C). -1 indicates severity reduced by 1 GOLD category (E.g. GOLD 2 to GOLD A).

N=112patients. P<0.01 using paired samples t-test.

Table 3: Difference in assessing the severity of stable COPD patients when moving from GOLD 1234 (spirometric based) to the new combined assessment i.e. GOLD ABCD classification.

No change in severity	42 patients (37.5%)
Severity classification upgraded	61 patients (54.4%)
Upgraded by 1 category	25 patients (22.3%)
Upgraded by 2 category	27 patients (24.1%)
Upgraded by 3 category	9 patients (8%)
Severity classification downgraded	9 patients (8%)
n=112 patients	

Discussion

Our research has shown that in a stable COPD patient group, there was a significant increase in the disease severity when using the new GOLD ABCD guidelines as opposed to the GOLD 1234 guidelines. This is the first study of its nature in an Irish cohort. This study builds on evidence that the old spirometric-based guidelines in accessing COPD severity are a poor descriptor of disease severity. There is a non-linear relationship between decline in FEV1 and symptoms. Using the new GOLD ABCD guidelines a combined assessment of patient reported exacerbations and spirometric evaluation together with patient reported symptoms appears to be more representative of the burden of COPD in stable patients. Our findings in an Irish context are in line with a large multicentre study, which showed

more patients were classified into more severe categories when using GOLD ABCD.[1,2] A similar key finding noted an increase in Grade D disease in a COPD cohort (97 to 327 patients) when moving from GOLD 1234 to GOLD ABCD. These findings are important in motivating the change of practice to incorporation of GOLD ABCD when reviewing stable COPD patients. Earlier commencement of appropriate evidence based therapies will improve overall patient care. Better clinical governance of our daily practice is supported by studies like this, which highlight crucial deficiencies behind traditional clinical practices. Increased targeted therapies mainly pharmacotherapy will result in fewer exacerbations and improved health-related quality of life due to reduced symptoms. By demonstrating the actual burden of COPD on our stable patients, the failure to effectively manage severe COPD is evident. A majority of COPD patients are still very symptomatic and at a high risk of exacerbations despite being stable. This will add to the argument of phenotype focused research at GOLD C and D patients to further therapies beyond current anticholinergics, beta 2 agonists, theophylline and inhaled corticosteroids. One-size fits all approach clearly does not work for the multiple phenotypes of COPD e.g. frequent exacerbators or dyspnea with mild airflow obstruction.[7] Current healthcare research is centered on effective pharmacotherapies being trialed and validated by objective improvements in symptoms and patient-reported exacerbations, as opposed to solely spirometric measurements. GOLD ABCD has also been shown to be a better predictor of future exacerbations.[8]

Our study's strength is the application of evidence-based guidelines without strict inclusion criteria making it a real-life snapshot of a COPD cohort. Avoiding exclusion bias commonly seen in most randomized control studies allows these results to be easily duplicated in other respiratory and primary care centers. The current GOLD ABCD guidelines recommend either mMRC or CAT for assessing patient reported symptoms. The CAT is a comprehensive questionnaire that has more detailed questioning than the mMRC scale, and covers a wider spectrum of the symptoms that COPD can harbor. Unfortunately the CAT is also time-consuming and lengthy, hence the mMRC is more easily applicable for busy outpatients services. It has been shown that using different symptom questionnaires can significantly alter the demographics of patient groupings.[9,10] This is logical when seeing that a difference in CAT of 10 or more is needed to differentiate between severity groupings as opposed to the simple 5-point ranking in mMRC. Still there is evidence that mMRC is better than CAT at predicting mortality. Neither questionnaire is as accurate as the St George's Respiratory Questionnaire, which is the most validated questionnaire for assessing patient-reported symptoms in COPD.[11,12] Furthermore numerous trials have also shown that despite the weakness of the GOLD 1234 classification, it was comparable or superior to GOLD ABCD in predicting mortality and decline in lung function.[13-15] Hence we should still apply rational thinking and personalized decision making to each patient.

On an economical perspective, increased noting of severity in stable patients will lead to increased pharmacotherapy. In 2010, it was estimated $49.9 billion was spent on COPD in the US directly or indirectly. This figure is expected to rise in coming years.[16] Earlier commencement of increased pharmacotherapy will also lead to an increase in the total cost accumulated over the life span of the patient, as there will be longer periods of treatment. Application of the new GOLD ABCD guidelines has significantly changed our assessment of COPD severity in a stable COPD population. Notably highlighting the previously under-recognized high-risk COPD patients, which was not highlighted when using the GOLD 1234 guidelines.

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The Clinical Utility of a Low Serum Ceruloplasmin Measurement in the Diagnosis of Wilson Disease

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Abstract
The first step in screening for potential Wilson disease is serum ceruloplasmin testing, whereby a level of less than 0.2g/L is suggestive of the disease. We aimed to determine what proportion of an Irish population had a low ceruloplasmin level, whether low measurements were appropriately followed-up and what were the clinical outcomes. We conducted a retrospective review of all serum ceruloplasmin measurements between August 2003 and October 2009 in a large tertiary referral centre in Southern Ireland. Clinical data, serum ceruloplasmin, liver function tests, urinary copper and liver biopsy reports were all recorded where available. 1573 patients had a serum ceruloplasmin measurement during the 7-year study period. 96 patients (6.1%) had a ceruloplasmin level <0.2g/L and of these only 3 patients had Wilson disease. There was only 1 new diagnosis. Only 27 patients (28.1%) had some form of confirmatory testing performed. In our centre's experience, the positive predictive value of a significantly low ceruloplasmin level is 11.1% (95% CI 2.91-30.3%). In practice a low serum ceruloplasmin measurement is often not followed by appropriate confirmatory testing. Measuring serum ceruloplasmin as a singular diagnostic test for Wilson disease or as part of the battery of unselected liver screening tests is inappropriate and low-yield.

Introduction

Wilson disease (WD) is a rare autosomal recessive defect in hepatocellular copper transport found in 3 out of 100,000 people[1]. It can lead to chronic copper deposition in the liver, brain and other tissues resulting in hepatotoxicity and neuropsychiatric sequelae[2]. The American Association for the Study of Liver Disease (AASLD) recommends screening for WD in any individual aged between 3 and 55 years with liver abnormalities of uncertain cause, especially those with co-morbid unexplained neurological disorders[3]. The first step in screening for potential WD is serum ceruloplasmin measurement, as approximately 85 to 90 percent of patients with WD have low serum ceruloplasmin levels[4]. However, low ceruloplasmin is not specific for WD; it can result from malabsorption, other liver diseases, protein-losing enteropathies, acquired copper deficiency, and hereditary aceruloplasminemia[5]. Ceruloplasmin is also an acute phase reactant and may be elevated in inflammatory states including WD patients with active hepatitis[6]. Hyper-estrogenic states including pregnancy or use of the oral contraceptive pill can also increase ceruloplasmin levels as ceruloplasmin mRNA has an estrogen responsive upstream region for its transcription[7]. Ceruloplasmin levels of less than 0.2g/L have been shown in one study to have a sensitivity of over 98%, specificity of over 55% and positive predictive value of over 48% for the diagnosis of WD on genotype-verified patients[8].

However, other research suggests the positive predictive value of ceruloplasmin <0.2g/L when used alone in patients with liver dysfunction may be as low as 5.9%[1]. For this reason, the guidelines recommend a number of confirmatory tests including a slit-lamp examination for detection of Kayser-Fleischer (KF) rings and 24-hour urinary copper estimation[3]. Additional investigations may be required for those with indeterminate results including a liver biopsy to determine the hepatic copper concentration or molecular testing for ATP7B mutations[9,10]. The European Association for the Study of the Liver (EASL) clinical practice guidelines also recognizes the limitations of serum ceruloplasmin measurement as a single test and recommends use of a combination of tests that reflect 'disturbed copper metabolism' with a diagnostic scoring system based on their results[11]. Our study assessed the incidence of low ceruloplasmin levels in the population and the clinical indications for testing. We determined whether further diagnostic testing was performed and what was the clinical significance of these results.

Methods

We conducted a retrospective review of all ceruloplasmin measurements at the Cork University Hospital clinical laboratory that serves a large primary care network, specialty clinics, and an 800-bed tertiary neurological and hepatological referral centre between August 2003 and October 2009. The time period was chosen to include the maximum data available. The study was approved by the hospital ethics committee. Clinical data, serum ceruloplasmin, liver function tests, urinary copper and liver biopsy reports were all recorded where available. Nephelometry was the technique used by the referral laboratory for measurement of serum ceruloplasmin during the study period. We treated ceruloplasmin values less than 0.2g/L as potentially positive for WD in accordance with published guidelines[3]. A diagnosis of WD was determined on the basis of the results of confirmatory testing (urine and hepatic copper, ophthalmologic examinations) and medical record documentation. Genetic testing results were recorded where available. WD heterozygotes were defined as those with only one disease-causing mutation in the absence of other supportive features. Data was analyzed using SPSS version 21.

Results

Demographics of the tested population

Our laboratory in Cork city, Ireland serves as a supra-regional centre for a total population of 1.1 million people. There were 1573 patients in the laboratory database who had a serum ceruloplasmin measurement during the 7-year study period. Table 1 outlines the demographic details and referral source by clinical speciality. A total of 476 serum ceruloplasmin levels (30.3%) were ordered in patients aged less than 3 years or greater than 55 years, a group outside AASLD recommendations[3]. See Figure 1 for the range of ceruloplasmin levels in the entire population. The median ceruloplasmin level was 0.28g/L (5th centile = 0.18, 95th centile = 0.5g/L). There was a significant difference in the median level for males and females at 0.27g/L and 0.3g/L respectively ($p<0.05$). There was a weak positive correlation between age and ceruloplasmin level with lower ages associated with lower ceruloplasmin level, $r = .124$, $n = 1573$, $p < .0005$.

Positive ceruloplasmin results

96 patients (male:female = 72%:28%) of the entire cohort (6.1%) had a ceruloplasmin level <0.2g/L (see Figure 1). The most common indications for testing were the presence of liver function test abnormalities (61.5%), a movement disorder (18.8%) and psychiatric disturbances (7.3%). 40.6% of the group were subsequently given a definitive liver disease diagnosis, the most common of which was alcoholic liver disease (14.6%) followed by non-alcoholic fatty liver disease (8.3%). Only 3 of the 96 patients (3.1%) had WD. Two of these patients had been previously diagnosed and were re-tested for disease monitoring. One patient was newly diagnosed with WD during the study period. His elevated 24-hour urinary copper excretion, Kayser-Fleisher rings along with low serum ceruloplasmin level confirmed the diagnosis. All 3 WD patients had a ceruloplasmin < 0.05g/L. In addition, 1 individual presenting with tremor was identified as a WD carrier with a single ATP7B mutation only. His genetic analysis was not consistent with a compound heterozygote and he never developed any further clinical symptoms.

CPD available online at www.imj.ie and questions on page 351.

Table 1: Demographics of the tested population	
	Total tested population
Number of patients	1,573
Gender (Male/Female)	55.2%/44.8%
Age range (years) (mean [SD])	1-93 (45.04 [18.07])
Serum Ceruloplasmin level range (g/L)	0.0499–1.8
Median Ceruloplasmin level (g/L) (IQ range)	0.28 (0.24–0.35)
Referral source by subspecialty:	
Gastroenterology	38.6%
General Internal Medicine	17.6%
Neurology	17.1%
General Practice	7.1%
Endocrinology	4.1%
Emergency Medicine	3.3%
General Surgery	3%
Psychiatry	1%
Other	7.6%

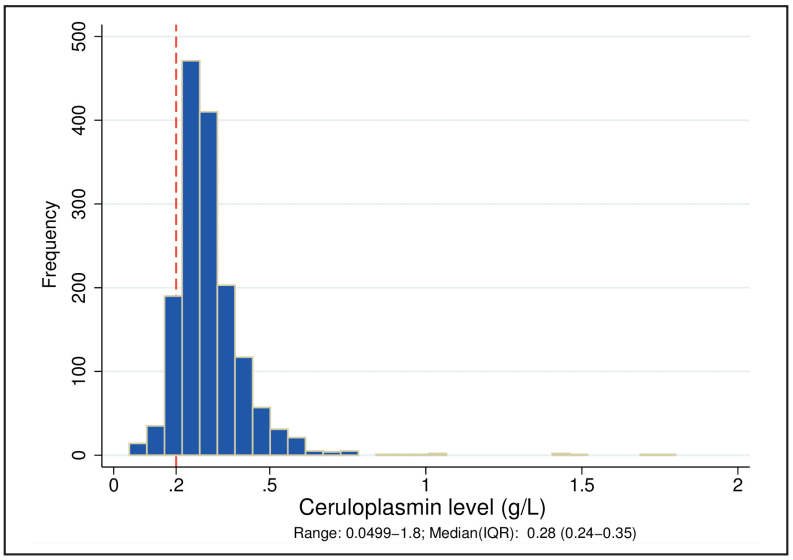

Figure 1: Distribution graph for the serum ceruloplasmin range for the population (Dotted line demarcates the range <0.2g/L – potentially positive ceruloplasmin levels)

Confirmatory testing for Wilson disease

After a positive/suggestive ceruloplasmin result, 27/96 patients (28.1%) had some form of confirmatory testing for WD performed. 14 patients (14.5%) were examined ophthalmologically for Kayser-Fleisher rings. 10 patients (10.4%) had a liver biopsy for hepatic copper quantification. 23 patients (24%) had urinary copper quantification. The mean follow-up period from the time of initial testing was 51.4 months (SD 30.3 months). Non-neurology/gastroenterology subspecialities were significantly less likely to do follow-up investigations. ($p<0.01$). Only 4 of the 27 patients (14.8%) who had further testing were under the care of the non-neurology/gastroenterology subspecialities.

Ceruloplasmin as a screening diagnostic test

In our centre's experience, the positive predictive value (PPV) of a ceruloplasmin level <0.2g/L is 11.1% (95% CI 2.91-30.3%). The false positive rate is 88.9% (95% CI 69.7-97.1%). At a hypothetical lower ceruloplasmin cut-off of 0.14g/L (as our local laboratory recently applied), the PPV increases to 33.3% (95% CI 9.04% -69.08%). There is no change in sensitivity as all 3 WD cases had a serum ceruloplasmin <0.05g/L. There was a statistically significant relationship between gender, age, and likelihood of a positive ceruloplasmin test result. The mean age of those with a positive level was 36.5 years compared to 45.8 years in those without ($p=0.03$). 10% of the tested male population had a low level versus 5.5% of the female population ($p=0.01$). There was a three-fold increase in frequency of ceruloplasmin testing per year over the 7 years studied comparing the tests done in 2003-04 (109) to 2008-2009 (362).

Discussion

Measurement of ceruloplasmin is often prompted in the evaluation and management of the patient with liver enzyme elevation. In our review of 7 years of ceruloplasmin ordering patterns, we found poor adherence to the AASLD guidelines. A significant proportion of the tested population was outside of the age-range recommended by the AASLD. It is very uncommon to present with Wilson disease after the age of 40[12]. In a large retrospective review of ceruloplasmin levels in 5023 patients, the number needed to test for late-onset Wilson disease (>40 years of age) to result in 1 new diagnosis was 2847[13]. In many cases, the liver abnormalities were not of uncertain aetiology and more common diseases were not yet out-ruled. Several of those with low ceruloplasmin levels had chronic hepatitis or alcohol-induced liver disease – conditions associated with false positive results secondary to poor hepatic synthetic function[1]. Less than 30% of the study population had appropriate follow-up investigations for a positive ceruloplasmin result such as ophthalmic examination for KF rings or liver biopsy for copper staining. Ceruloplasmin measurements were requested by a variety of subspecialites, the most common being gastroenterology, neurology and internists. The most common reason for testing was for evaluation of liver enzyme elevation or established liver disease. Physicians who were not gastroenterologists or neurologists were less likely to perform confirmatory investigations ($p<0.01$). This suggests lack of familiarity from other subspecialities with the diagnostic algorithm of investigations necessary to confirm or exclude WD.

Serum ceruloplasmin measurement with a cut-off level of less than 0.2g/L had a low PPV for WD in our study similar to previously published work[1]. This relates to the low pre-test probability of the diagnosis in an unselect population with a high prevalence of liver disease with known etiology. Lowering the reference range to 0.14 would have improved the test's performance without adversely impacting on sensitivity. Greater diagnostic accuracy with this lower threshold has been reported in previous studies with a caveat of local validation necessary[8]. In this study, serum ceruloplasmin concentrations of less than 0.20, 0.14, and 0.10 g/L showed positive predictive values of 48.3%, 100%, and 100%, respectively, In the validation group, a serum ceruloplasmin threshold of 0.14 g/L rendered 100% sensitivity and specificity. However it is possible that not every patient with WD was captured on the basis of this screening test. As previously mentioned, there may be false negative results for WD in the face of infection or inflammation[14]. Pregnancy and supplemental estrogen therapy may have a similar impact[15]. Future test requests/interpretations should take such mitigating clinical factors into account. Method of testing may influence results. Serum ceruloplasmin can be measured enzymatically by its copper-dependent oxidase activity towards specific substrates or by antibody-dependent assays. The latter includes nephelometry, radioimmunoassay and radial immunodiffusion. The results are generally similar, except for the antibody-dependent and the immunodiffusion assays, which may overestimate the ceruloplasmin levels. The overestimation may occur because the two testing methods do not differentiate between apoceruloplasmin (ceruloplasmin unbound to copper) and holoceruloplasmin (ceruloplasmin with its full complement of 6 copper atoms per molecule)[16]. Nephelometry was the technique used consistently throughout our study period.

There were several limitations to this study. We did not follow up patients who had normal (>0.2g/L) serum ceruloplasmin levels to ensure that they did not subsequently develop WD. Thus we may not have captured the testing characteristics of all affected patients. Our ability to evaluate ceruloplasmin as a diagnostic

test was limited as we could only include measurements where definitive confirmatory testing was performed. In addition, it's possible that the heterozygote carrier we identified did in fact have WD with a less severe phenotype. Given that most WD patients are compound heterozygotes and that there exists many disease-specific mutations, it can be difficult to differentiate a healthy carrier from an affected individual[17]. Routine screening of all patients is of limited clinical utility and ceruloplasmin should not be used as part of the empiric battery of tests forming the liver screen. More judicious use of ceruloplasmin in a selected population with a higher pre-test probability of Wilson disease may increase its utility as a screening tool. Diagnostic scoring systems such as that proposed by the EASL[11] may help risk stratify or contextualize a low serum ceruloplasmin result. There is a clear need for increased education regarding the appropriate indications for ceruloplasmin testing across all referring clinical specialties, but in particular non-neurologist and non-gastroenterology sources. Test performance may improve with locally validated lower reference ranges, guideline adherence and use in a more select population.

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Is the Current BST ePortfolio fulfilling its Role in the Training of Clinical Medicine SHOs?

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Abstract
While the objective recording of clinical competencies in an electronic portfolio (ePortfolio) has become a key aspect of basic specialist training (BST), it continues to divide opinion. We surveyed medical trainees and their supervisors in the Dublin region examining their views of the ePortfolio and workplace-based assessments (WPBAs). Responses were received from 27 of 149 (18.1%) SHOs and 24 of 307 (7.9%) consultants. Our results highlight significant dissatisfaction amongst trainees with 20 (74.1%) stating that the ePortfolio is not an effective educational tool. Consultants had more mixed views. While 16 (66.7%) reported that feedback sessions were useful for trainee development, only 4 (16.7%) found the ePortfolio to be useful in highlighting trainees' strengths and weaknesses. Although other studies have emphasised its educational potential, our results suggest that practical barriers, such as time constraints and a lack of training, lead to poor engagement and a negative view of the ePortfolio.

Introduction
In Ireland, senior house officers (SHOs) undergoing basic specialist training (BST) are required to participate in workplace-based assessments (WPBA) and complete an electronic portfolio (ePortfolio). BST is a curriculum-based programme of supervised clinical training run by the Royal College of Physicians of Ireland (RCPI) for trainees in the field of general internal medicine[1]. SHOs are assessed by their supervising consultant and attend an annual review of their ePortfolio during which feedback is given. WPBAs consist of mini-clinical assessment exercises (Mini-CEXs), directly observed procedural skills (DOPS) and case-based discussions (CBD). Mini-CEXs involve the trainer

observing a fifteen minute interaction between the trainee and a patient, assessing history-taking, physical examination skills, clinical judgement, professionalism, efficiency or overall clinical care. In DOPS, the situation is designed to assess the capabilities of the trainee as they perform a practical procedure while CBDs are for documenting conversations or presentations about the trainee's cases and are used to assess clinical decision making[2]. Although subjective reports emphasise the positive educational benefits of WPBAs, a systematic review by Miller et al[3] found no evidence that these WPBAs lead to improved performance in clinical practice.

The ePortfolio is used to track the progress and competency of trainees. It aims to provide a more objective method of assessment and to ensure that the programme is being completed to the required standard[2]. Prior to the introduction of the ePortfolio in 2011, training was less formal or centralised. While some argue that this approach is more flexible, it was difficult to assess whether all trainees possessed the necessary competencies. Since the introduction of the ePortfolio into the Irish BST programme, there have been few papers looking at its effectiveness or how it is viewed by doctors themselves. Our study aims to determine if trainees and their supervisors see the ePortfolio as an important learning exercise, or merely as a time consuming obligation. It is based on a similar British study by Tailor et al[4] who concluded that, while the ePortfolio and WPBAs can have significant educational merit, improvements in mentoring and feedback are required. Our study aims to discover whether the ePortfolio is serving its purpose in the Irish context according to trainees and their supervisors.

Methods

Two online surveys were produced with the first aimed at SHOs completing BST in clinical medicine and the second aimed at consultants who have SHOs under their training. The aforementioned British paper by Tailor et al4 was used as a template in designing the surveys in order to enable direct comparison between the Irish and British responses. The SHO survey comprised of 24 questions exploring the accessibility and effectiveness of the ePortfolio and its role in facilitating specialist training for the SHOs. It also questioned perceptions of the WPBAs and whether they are fulfilling their role in promoting constructive criticism and feedback. The consultant survey consisted of 19 questions and addressed similar areas including the usefulness of the ePortfolio and whether or not they believe it plays an important role in medical training. Both surveys allowed for additional comments. Initially, an email with links to both surveys was sent out to all clinical medicine SHOs and consultants in St. James's Hospital and The Adelaide and Meath Hospital, both of which are located in Dublin. Responses were collected over a one month period between February and March 2015. This was followed by distributing hard copies of the surveys by hand to consultants and SHOs before and after grand rounds in both hospitals. No demographic data was requested in order to ensure anonymity and limit responder bias. No statistical analysis was performed as the data collected was qualitative.

Results

Of the 149 SHOs in both sites, 27 (response rate = 18.1%) completed surveys were received. These results are summarized in Table 1. Only 1 (3.7%) trainee believes that the ePortfolio is an effective educational tool while 24 (88.9%) disagree that their development has benefited from using it. As shown in Table 2, the opinions of the 24 of 307 (response rate = 7.9%) consultants follow a similar theme with only 8 (33.3%) finding the ePortfolio to be an effective educational tool. Their views are less negative overall though, with 12 (50%) consultants compared to 20 (74.1%) SHOs disagreeing that the ePortfolio is useful in

Table 1: Summary of responses from SHOs

Question	Agree/ Strongly agree n (%)	Undecided n (%)	Disagree/ Strongly disagree n (%)
The ePortfolio is an effective educational tool for trainees	1 (3.7)	6 (22.2)	20 (74.1)
My development as a trainee has benefited from using the ePortfolio	1 (3.7)	2 (7.4)	24 (88.9)
The ePortfolio website is easy to use	8 (29.6)	0 (0.0)	19 (70.4)
The ePortfolio is useful in highlighting my strengths and weaknesses	2 (7.4)	4 (14.8)	21 (77.8)
The ePortfolio encouraged me to reflect on my clinical practice	2 (7.4)	5 (18.5)	20 (74.1)
I understand what a 'personal development plan' comprises	16 (59.3)	1 (3.7)	10 (37.0)
My personal development plan helps to focus my training	4 (14.8)	6 (22.2)	17 (63.0)
I had sufficient training on how to use ePortfolio*	2 (7.4)	3 (11.1)	21 (77.8)
I know what I am expected to document in the ePortfolio	6 (22.2)	6 (22.2)	15 (55.6)
I know how many of each type of assessment I am required to document	11 (40.7)	3 (11.1)	13 (48.1)
I am familiar with the contents of the curriculum relevant to my stage of training	12 (44.4)	6 (22.2)	9 (33.3)
I know how to access my curriculum	22 (81.5)	3 (11.1)	2 (7.4)
I view workplace assessments as a means to 'passing' the year	12 (44.4)	5 (18.5)	10 (37.0)
I view workplace assessments as a learning exercise	15 (55.6)	2 (7.4)	10 (37.0)
Feedback received from the workplace assessment is useful*	11 (40.7)	5 (18.5)	10 (37.0)
My clinical practice has improved on the basis of feedback from workplace assessments*	9 (33.3)	7 (25.9)	10 (37.0)
	Always/Often n (%)	**Sometimes n (%)**	**Rarely/ Never n (%)**
I inform my assessor of my wish to be assessed for mini-CEX or DOPS prior to carrying out clinical examinations or procedures	2 (7.4)	7 (25.9)	18 (66.6)
I avoid performing workplace assessments on complex or difficult cases owing to the fear of receiving negative feedback	3 (11.1)	4 (14.8)	20 (74.1)
How often does somebody more junior than a specialist registrar perform a workplace assessment for you?	4 (14.8)	3 (11.1)	20 (74.1)
My assessor is present during workplace assessments	3 (11.1)	7 (25.9)	17 (63.0)
Verbal feedback is given immediately after my workplace assessments*	9 (33.3)	6 (22.2)	11 (40.7)
Feedback from workplace assessments is documented on the ePortfolio immediately after the assessment in question*	2 (7.4)	3 (11.1)	21 (77.8)
	<5 mins	**5-10 mins**	**>10 mins**
On average how long is spent giving verbal feedback after a workplace assessment?*	20 (74.1)	5 (18.5)	1 (3.7)

*Answer not received from all respondents.

Table 2: Summary of responses from Consultants			
Question	**Agree/ Strongly Agree n (%)**	**Undecided n (%)**	**Disagree/ Strongly Disagree n (%)**
The ePortfolio is an effective educational tool for junior doctors	8 (33.3)	9 (37.5)	7 (29.2)
My trainees' development has benefited from the use of the ePortfolio	6 (25.0)	10 (41.7)	8 (33.3)
The ePortfolio website is easy to use	3 (12.5)	7 (29.2)	14 (58.3)
The ePortfolio is useful in highlighting trainees' strengths and weaknesses*	4 (16.7)	7 (29.2)	12 (50.0)
I believe reflective practice plays an important role in medical training	24 (100.0)	0 (0.0)	0 (0.0)
I review my trainees' reflective logs during our meetings	9 (37.5)	4 (16.7)	11 (45.8)
The personal development plan is a useful tool in helping trainees to focus their aims and objectives	12 (50.0)	9 (37.5)	3 (12.5)
I have received sufficient training on how to use the ePortfolio	5 (20.8)	3 (12.5)	16 (66.7)
I know what trainees are expected to document in the ePortfolio	14 (58.3)	4 (16.7)	6 (25.0)
I know how many of each type of assessment trainees are required to do	9 (37.5)	3 (12.5)	12 (50.0)
The number of assessments required of trainees is excessive	7 (29.2)	10 (41.7)	7 (29.2)
I am familiar with the contents of my trainees' curriculum	18 (75.0)	1 (4.2)	5 (20.9)
I believe my feedback sessions with trainees is useful for their development*	16 (66.7)	5 (20.8)	2 (8.3)
I find it difficult to fit in the required number of assessments and feedback within my clinical schedule	15 (62.5)	5 (20.8)	4 (16.7)
	Always/Often n (%)	**Sometimes n (%)**	**Rarely/ Never n (%)**
I only perform workplace-based assessments if requested by a trainee prior to the clinical encounter/procedure in question	7 (29.2)	12 (50.0)	5 (20.8)
I am physically present for any clinical encounter that is signed off as an assessment	18 (75.0)	3 (12.5)	3 (12.5)
I give verbal feedback immediately after the assessment taking place	18 (75.0)	2 (8.3)	4 (16.7)
	<5mins	**5-10mins**	**>10mins**
On average, how long is spent giving feedback on a workplace assessment?	6 (25.0)	11 (45.8)	7 (29.2)
	Never	**1-2 years**	**>3years**
When was the last time you received formal training in giving feedback?*	10 (41.7)	4 (16.7)	8 (33.3)

*Answer not received from all respondents.

highlighting the strengths and weaknesses of trainees. There were some positives found as 16 (66.7%) consultants and 11 (40.7%) SHOs agree that feedback sessions are useful while all 24 (100%) consultants believe that reflective practice plays an important role in medical training. Interestingly, consultants and trainees disagree over the supervision of WPBAs. Although, 17 (63%) SHOs stated that their assessor is rarely/never present during WPBAs, 18 (75%) consultants stated that they are often/always present. In a qualitative analysis of the additional comments, the major theme noted was that the ePortfolio is "cumbersome" and "time consuming" with both SHOs and consultants viewing it as a "box-ticking exercise". Another theme that was evident from the SHO responses was the request for formal, structured training whether this be "one hour tutorials on an aspect of the consultant's speciality" or a "course day" both of which could "provide a social platform to encourage education".

Discussion

The results of this survey highlight significant dissatisfaction amongst trainees and mixed views amongst their supervisors regarding the ePortfolio. Its effectiveness is called into question as approximately half of consultants and three quarters of SHOs surveyed find the ePortfolio difficult to use and inadequate in highlighting the strengths and weaknesses of trainees. However, it is not possible to generalise these results due to the small sample size and low response rate of this study. Portfolios and WPBAs play a wide role in medical training. The RCPI ePortfolio was designed with the aim of providing a secure record of professional competencies in addition to supporting clinical feedback and reflective practice. However, our results suggest that the majority of supervisors and trainees feel that it does not encourage reflection on clinical practice in its current format. These results are supported by two British studies. According to Tailor et al[4] only 15% of trainees and 30% of supervisors view the ePortfolio as an effective educational tool, while Johnson et al[5] found that 45% of trainees believe the ePortfolio does not facilitate rapid feedback. Yet in spite of these results, other evidence in the literature suggests that portfolios and WPBAs can enhance educational development if they are implemented correctly along with sufficient tutor support[6]. A Canadian study of obstetrics and gynaecology trainees found that recording an online portfolio significantly improved the likelihood of trainees undertaking self-directed learning[7]. In another questionnaire, over two thirds of British foundation year 2 (FY2) doctors rated the effectiveness of the portfolio in meeting their educational requirements as 6 or higher on a Likert scale of 1-9[8], while an observational study by Morris et al[9], found that 65% of FY1 British trainees believed that carrying out DOPS would help further their careers. This contrasts starkly with the SHOs we surveyed. Although 40% found the verbal feedback to be useful, almost 90% thought that their development has not benefited from completing the ePortfolio.

Practical difficulties such as time constraints, insufficient training and a lack of supervisor engagement may contribute to a negative view of the ePortfolio in Ireland. The majority of consultants stated that they struggle to fit the required assessments into their clinical schedule. This finding is supported by Pereira et al[10] who found that over 40% of surgical trainees felt that the time required to complete a mandatory online portfolio impacted negatively on their overall training. Insufficient teaching in how to use the ePortfolio may also be an issue as emphasised by the fact that almost three quarters of supervisors have not received training on the ePortfolio within the last three years. Finally, while three quarters of consultants stated that they are always/often physically present during the assessments, alarmingly, almost two thirds of trainees report that their supervisor was rarely/never present. Admittedly, responder bias could play a role in these differing views. However, this result is not found in the corresponding British study where only 13% of trainees report that their supervisor is rarely/never present[4]. Thus, a lack of mentor engagement may play a role in the greater dissatisfaction with the ePortfolio found amongst Irish trainees. Our results indicate the need for further research examining the ePortfolio and WPBAs which should focus on how to improve the portfolio process so that, as well as ensuring competence and adequate training, it also facilitates feedback and engagement from both trainees and supervisors.

Unfortunately, our study is hampered by a number of major limitations most notably the small sample size and low response

rate. For this reason, and due to the narrow demographic area, our conclusions cannot be extrapolated to all training programs in Ireland. Furthermore, while we did gather responses from trainees who were at various stages of their BST, in order to ensure anonymity and encourage openness, we did not record any demographic data. In hindsight, the lack of trainee and consultant data weakens the study significantly. Finally, since both surveys were initially emailed to participants, the responses received were more likely to have been from those with stronger opinions on the topic. Thus, responder bias may have led to an exaggeration of the results. In conclusion, in this survey SHOs are quite critical of the ePortfolio. While consultants accept the importance of reflective practice and share a more mixed view, many find the ePortfolio and WPBAs to be ineffective also. Although other studies have emphasised the educational potential of portfolios and their importance in ensuring physician competence, our results suggest that practical barriers, such as time constraints, lead to poor engagement and a negative view of the ePortfolio. While our conclusions are limited by the small sample size, our results indicate the need for a larger study in this area. This may examine how the portfolio process can be improved in order to ensure clinical competence as well as encouraging training, feedback and reflection.

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Management of Patients with Subclinical Hypothyroidism in Primary Care

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Abstract
Subclinical hypothyroidism (SCH) is defined as a raised serum thyroid stimulating hormone level with normal thyroxine. Despite a prevalence of up to 9% of the adult population there is widespread uncertainty on how to manage it. The aim of this study was to assess how older adults with SCH are managed in primary care. A retrospective case-note review was carried out on patients attending Mallow Primary Healthcare Centre. This study identified patients 65 years and over meeting the criteria for SCH in one year. The prevalence of SCH in this study was calculated as 2.9%. 22.2% of patients were treated with thyroxine. 6.1% of untreated patients progressed to clinical hypothyroidism within the study period while 18.2% spontaneously reverted to normal TSH levels.

Introduction

Subclinical hypothyroidism (SCH) is a common biochemical abnormality detected in primary care[1]. There has been a lot of controversy regarding the clinical significance of SCH. While studies have been inconsistent, it appears SCH may adversely affect cardiovascular risk factors, particularly lipid levels[1], as well as cognitive and psychiatric function[2,3]. To date there is significant uncertainty regarding the need for thyroxine replacement. A 2009 Cochrane review failed to offer clarity on the matter, recommending that clinical judgment and patient preference guide decision making until further research is completed[4]. The objective of this study was to investigate how it is currently managed in an Irish primary care setting.

Methods

This study was a retrospective case note review on older general practice patients meeting the criteria for subclinical hypothyroidism diagnosis in a one year period. The study was carried out in Mallow Primary Healthcare Centre (MPHC), which incorporates three separate GP clinics. Participants were adults aged 65 years or over. Inclusion criteria were age greater than 65 years and one thyroid function test (TFT) meeting the

Table 1: Management/outcome of SCH

	Clinic 1 n=32	Clinic 2 n=24	Clinic 3 n=43	Total n=99
Treated with thyroxine, number (%)	6 (18.8)	10 (41.7)	6 (14.0)	22 (22.2)
No action, number (%)	14 (43.8)	9 (37.5)	30 (69.8)	53 (53.5)
≥2 elevated TSH tests	11 (34.4)	5 (20.8)	12 (27.9)	28 (28.3)
1 elevated TSH test	3 (9.4)	4 (16.7)	18 (41.9)	25 (25.3)
Reverted spontaneously to normal TSH, number (%)	9 (28.2)	4 (16.7)	5 (11.6)	18 (18.2)
Progressed to overt hypothyroidism, number (%)	3 (9.4)	1 (4.2)	2 (4.7)	6 (6.1)

criteria for SCH diagnosis in the study period. SCH is defined in this study as a TSH of greater than 4.6mIU/L, with a T4 within normal limits. Exclusion criteria were previous diagnosis of clinical hypothyroidism, incomplete files and death during the study period. The initial search yielded 174 patients. 75 patients were excluded, leaving a total of 99 patients in the study. Of these 75 patients, 66 were excluded as they had a prior diagnosis of overt hypothyroidism, 8 patients had incomplete notes and 1 patient had passed away. All data was analysed using SPSS Version 20.

Results

A total of 99 patients over the age of 65 were identified as having SCH, giving a prevalence among those tested of 2.8%. The majority of TFTs performed were carried out as part of a routine check up (66%). A smaller percentage (28%) were being followed up as they had a history of abnormal TFTs. In 6% of cases the GP specifically requested the thyroid function test because of symptoms reported by the patient. Table 1 outlines how SCH was managed in the three clinics. In total 22.2% of patients with SCH were treated with thyroxine, with a mean starting dose of 41.6mcg (SD 24.4). The mean TSH which prompted treatment was 6.4mIU/L (SD 1.2). Of those who did not receive treatment 18.2% reverted spontaneously to normal TSH levels while 6.1% progressed to clinical hypothyroidism.

Discussion

This retrospective study characterises primary care patients with subclinical hypothyroidism. The prevalence of SCH in the study sample was calculated as 2.8%, compared to a national prevalence of 2.3% in the same age group[5]. There was a slight predominance of females as would be expected, given that SCH is more common among older women than men[1]. The mean TSH level was 5.1mIU/L. This is in line with previous research which has suggested that up to 90% of patients with SCH have TSH readings of less than 10mIU/L. The mean TSH level that prompted treatment was 6.4mIU/L. This is in contrast to many of the recommendations for management which state that treatment should be reserved for those with a TSH of greater than 10mIU/L. Several studies in the past have assessed the natural course of SCH. In this study it was found that 6.1% of patients progressed to clinical hypothyroidism within one year. This is higher than the figure quoted in the literature of 2-3%. In contrast to this, 18.2% of untreated patients spontaneously reverted to normal TSH levels during the one year period. Again this is a higher figure than quoted in the literature of 5.5%.

In summary, subclinical hypothyroidism is a prevalent condition among older adults in the community. It is often identified by general practitioners on routine check-up. It can be associated with non-specific symptoms of thyroid dysfunction. Approach to management varies with 22% of patients treated with thyroxine. Definitive guidelines on treatment would help simplify management of this common condition.

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A Rare Cause of Testicular Pain: Thrombosis of the Pampiniform Plexus

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Abstract

Testicular pain is a common presentation in the emergency department. The cause includes a wide array of differentials. This report highlights a case of thrombosis of the pampiniform plexus as a rare cause of testicular pain. Doppler ultrasound should be the first line investigation. Symptomatic relief with anti-inflammatory medication should be sufficient for management.

Introduction

Testicular pain is a common presentation in the emergency department. The cause includes a wide array of differentials. This case report highlights a rare cause of testicular pain which can be diagnosed by non-invasive imaging.

Case Report

A 23 year old man presented to the Emergency Department with left sided testicular and groin pain. This pain had begun insidiously two days previous during this man's normal working day. He described a distressing and unremitting pain that radiated up the left groin towards the left flank. There were no urinary or bowel symptoms. There was no past medical history of note. Gross examination of the testis was unremarkable. There was exquisite tenderness in the superior left testicular region, along the epididymis and spermatic cord on clinical exam. There was no palpable mass, trans-illuminable swelling, hernia or temperature gradient. Ultrasound revealed an expanded vein in the left spermatic cord which contained echogenic material consistent with thrombus, see Figure 1 and 2. There was no abnormality in the testicular vein or artery. The testes, epididymi or kidneys were unremarkable. The appearances were consistent with a thrombosed left pampiniform plexus.This patient was managed at Emergency Department level following consultation with the Urology team. A thrombophilia screen was sent for analysis. The patient was discharged on Ibuprofen and advised to return if symptoms of a pulmonary embolism developed. At follow up outpatients one month later the pain had resolved. The thrombophilia screen was negative. No further follow up was deemed necessary.

Discussion

Spontaneous thrombosis of the pampiniform plexus is very uncommon, with few references in the literature. Pampiniform plexus thrombosis has previously been misdiagnosed as an incarcerated inguinal hernia[1] and orchitis[2]. Diagnosis can be

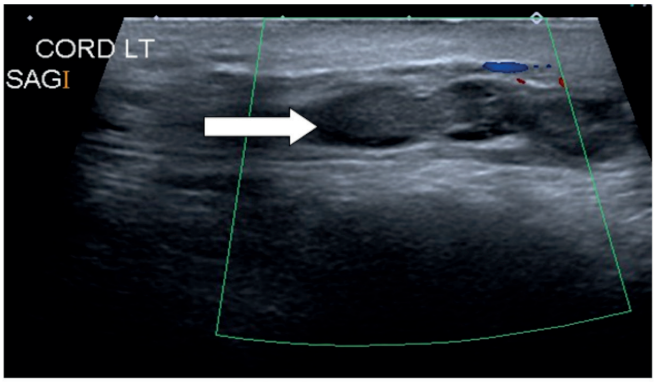

Figure 1: There is a dilated non-compressible vessel present containing echogenic material consistent with acute thrombus (arrow).

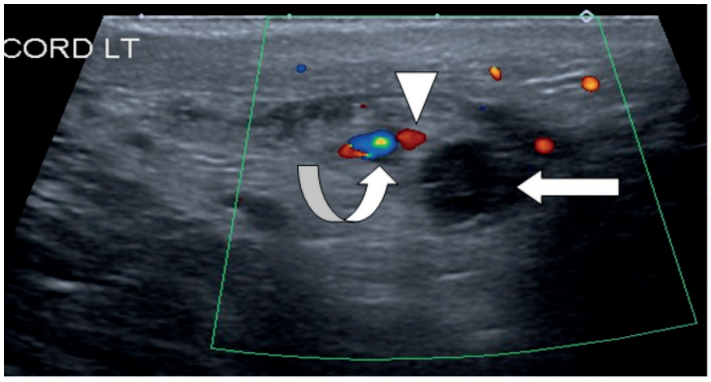

Figure 2: The non-compressible vessel (arrow) in the spermatic cord is separate to the testicular artery (arrowhead) and vein (curved arrow) which appear normal.

challenging. In 1993 Gleason described a case where the sonographic appearance mimicked an incarcerated left inguinal hernia by demonstrating a tubular, hypoechoic, noncompressible, cystic inguinal mass with no flow evident on colour Doppler imaging[3]. Hence because of these misdiagnosed cases men with thrombosis of the pampiniform plexus often undergo unnecessary treatment such that the diagnosis is often only made intra-operatively. Interestingly, Hashimoto and Vibeto noted in 2006 that thirteen of fifteen cases they examined involved the left side[1]. There are no guidelines for the management of a pampiniform plexus vein thrombosis. Investigations outlined in previous case reports include a thrombophilia screen[1,4], CT of abdomen to rule out causes of venous obstruction[1] and surgical exploration for possible torsion, incarcerated hernia or malignancy[5]. Since these veins do not directly communicate with the inferior vena cava or left renal vein, the chances of embolization are small. Symptomatic treatment with non-steroidal anti-inflammatory medications is generally sufficient without the need for anti-coagulation. Examination with ultrasound should be the first line investigation. It offers a non invasive and accurate means of establishing the diagnosis. Further imaging is often unnecessary if the thrombosis is confined to the superficial spermatic vein.

In summary this is a rare presentation that is low of the differential list for causes of testicular and or groin pain. Left sided pain is the most common feature based on cumulative case report data. Doppler ultrasound provided a clear diagnosis in this case. Management remains unclear but proximal extension of the thrombosis is the most significant indication for further investigation.

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Gentamicin Dosing in Therapeutic Hypothermia; a Quality Improvement Initiative

Sir,

We read with interest a number of articles on gentamicin dosing in neonates treated with therapeutic hypothermia[1-3]. Therapeutic hypothermia has now become the standard of care for newborn infants with hypoxic-ischaemic encephalopathy. Many of these infants concurrently receive gentamicin. Gentamicin is nephrotoxic and ototoxic at high serum concentrations. We therefore carried out a study in The National Maternity Hospital Holles St to analyse trough and peak gentamicin levels in infants who were cooled and compared them to a control group of non-cooled infants.

A retrospective review was undertaken of infants who were cooled in the National Maternity Hospital, Holles St, between March 2013 and February 2015. Infants were included if they were treated with gentamicin from birth for at least 48 hours. These infants were compared to a group of infants admitted to the NICU who were also treated with gentamicin. All infants were at least 36 weeks gestation. A total of 43 infants were cooled during the defined period. Gentamicin trough levels were available on 34 (79%) of these infants. The median trough level was 1.65 (IQR 1.13), compared to a median trough level of 0.85 (IQR 0.65) in 42 control infants ($p<0.05$). Of note 29% of the cooled group had a trough level which was greater than the accepted level of 2mg/L, compared to only 7% of the control group. Peak values in both groups were therapeutic.

Gentamicin trough levels were significantly higher in cooled infants. This has led to a change in our current practice. Cooled infants now receive gentamicin on a 36 hourly dosing schedule as opposed to 24 hourly and a trough level is taken prior to the 2nd dose as opposed to the 3rd dose.

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The Tip of the Iceberg – 'Never Ignore a Chronic Cough'

Sir

A 'chronic cough' is defined as a cough lasting longer than 8 weeks. Around 10% of referrals to respiratory outpatient have a chronic cough as the presenting complaint. Coughing is classically described as a protective reflex response to mechanical and chemical airway stimulation and therefore a chronic cough must be adequately investigated. The following case illustrates this. A 63 year old, non smoker, asthmatic man who work in a timber factory as a manual worker had been complaining of an intermittent chronic cough for the past 20 years. He was started on symbicort inhaler by his GP and he noticed a slight improvement since. He presented for the first time to the emergency department with a three days history of productive cough associated with greenish sputum, wheeze, shortness of breath and left sided pleuritic chest pain. On inspection, he was unwell with a temperature of 38 degree celsius. His pulse was 96 beat per minute, regular in rhythm and volume and normal in character. Blood pressure was 110/76. Oxygen saturation was 87% on room air with a respiratory rate of 18 breaths per minute. His peak flow was 200 litres per minute. Chest examination revealed bilateral wheeze with coarse crackles on the left base of his lung.

Chest radiograph showed the presence of left sided pleural effusion with a left lower lobe collapse. Computer tomography scan of the thorax interestingly showed a metal stent like object within the left main bronchus proximal to the collapse and consolidation in the left lower lobe with residual pleural effusion. The presence of this object was later confirmed on bronchoscopy and revealed to be a pigeon foot rim embedded in granulation tissue suggesting that it was in situ for a long period of time. This foreign body was then extracted via rigid bronchoscopy. Retrospectively, the patient had no recollection of foreign body inhalation but admitted to being a pigeon fancier 20 years ago. Chronic cough are elicited via the sensory neuronal dysfunction of vagal afferents. Interestingly, recent trans-neuronal tracing experiments in rodents, have suggested that even below the vocal cords (extra-thoracic trachea), some vagal afferent fibres terminate in the spinal tract trigeminal nucleus. Whether the localisation of sensations of irritation to the throat in patients with chronic cough represents local laryngeal pathology or is referred from the lower airways or other vagally innervated viscera, such as the oesophagus, currently remains unknown.[1]

Reflecting on this case showed that the chronic cough of this man was initially thought to be due to his asthma thereby reinforcing the point that a chronic cough always need to be adequately investigated as it can masked sinister pathology such as a foreign body or even malignancy.

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The Worrying Modern Scenario of Benign Pathology after Nephrectomy for Presumed Renal Cancer

Sir

The detection of incidental renal tumours has dramatically increased over the last twenty years as a result of widespread ultrasound and CT scanning for various other conditions. Renal cancer is now an incidental diagnosis in over 50% of cases[1]. Survival rates have dramatically improved as a result of early surgical intervention (radical or partial nephrectomy)[2]. However, despite advances in radiology, benign renal lesions may be indeterminate from renal cancer. We report our incidence of patients undergoing nephrectomy for clinically diagnosed renal cancer but with subsequent benign pathology.

A 12 year retrospective study was performed on all 913 patients who underwent nephrectomy at Tallaght hospital (2000-2012). Five hundred and ninety three patients had a nephrectomy for presumed renal cancer of whom 575 patients had confirmed neoplasm by pathology. Forty-two patients had benign pathology (radiological false positive rate 7.1%). The average lesion size was 5.9 cms and the most frequent diagnoses included oncocytoma (69%) and angiomyolipoma (17%). The incidental detection of small renal masses (SRM) has particularly increased and management is controversial. Other studies demonstrate false-positive diagnostic rates for cancer between 10-30%[3-5]. Renal biopsy can be useful in small and indeterminate lesions but is not diagnostic in up to 22%. Contrast enhanced ultrasound (CEUS) and blood oxygenated level dependent MRI (BOLD MRI) show promise in differentiating benign and malignant renal masses but presently there is no definitive test radiological or otherwise for renal cell malignancy[6,7]. The current significant overtreatment of incidentally detected benign renal lesions is a serious concern but should be considered in the overall context of the now excellent prognosis for incidentally detected renal cancer.

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The Positive Impact of Bariatric Surgery on Sleep

H Xie, L Doherty, C O'Boyle. Ir Med J. 2015; 108: 296-9.

Question 1
The total number of patients in the study was

a) 161
b) 163
c) 165
d) 167
e) 169

Question 2
The median patient BMI before surgery was

a) 45
b) 47
c) 49
d) 51
e) 53

Question 3
The mean reduction in the patients' BMI after surgery was

a) 10.2
b) 12.2
c) 14.2
d) 16.2
e) 18.2

Question 4
The proportion of patients with improved sleep quality after surgery was

a) 83.9%
b) 85.9%
c) 87.9%
d) 89.9%
e) 91.9%

Question 5
The number of patients who discontinued positive airway pressure (PAP) treatment after surgery was

a) 33
b) 35
c) 37
d) 39
e) 41

In-hospital Cardiac Arrest at Cork University Hospital

E O'Sullivan, C Deasy. Ir Med J. 2015; 108: 299-302.

Question 1
The number of patients who suffered an in-hospital cardiac arrest (IHCA) was

a) 55
b) 57
c) 59
d) 61
e) 63

Question 2
The survival rate for IHCA patients with a shockable rhythm was

a) 64.4%
b) 66.4%
c) 68.4%
d) 70.4%
e) 72.4%

Question 3
The proportion of the IHCA patients who were male was

a) 61.4%
b) 63.4%
c) 65.4%
d) 67.4%
e) 69.4%

Question 4
The mean of the IHCA patients was

a) 70.3 years
b) 72.3 years
c) 74.3 years
d) 76.4 years
e) 78.4 years

Question 5
The survival rate for patients who suffered an IHCA on the wards was

a) 1.5%
b) 2.5%
c) 3.5%
d) 4.5%
e) 5.5%

The Clinical Utility of a Low Serum Ceruloplasmin Measurement in the Diagnosis of Wilson Disease

D Kelly, G Crotty, J O'Mullane, M Stapleton, B Sweeney, SS O'Sullivan. Ir Med J. 2015; 108: 304-7.

Question 1
The number of patients with a low ceruloplasmin was

a) 92
b) 94
c) 96
d) 98
e) 100

Question 2
The number of patients who subsequent confirmatory testing was

a) 25
b) 27
c) 29
d) 31
e) 33

Question 3
The positive predictive value of a low ceruloplasmin level was

a) 9.1 %
b) 11.1%
c) 13.1%
d) 15.1%
e) 17.1%

Question 4
The number of patients with Wilson disease was

a) 3
b) 4
c) 5
d) 6
e) 7

Question 5
The total number of patients who had a ceruloplasmin measurement was

a) 1543
b) 1553
c) 1563
d) 1573
e) 1583

Thinking of retiring?

Let IMO Financial Services advise you on the best action to take.

If you're thinking of retiring, talk to IMO Financial Services today for expert advice on your retirement options.

> "We can help you navigate your way through the options available to you."

IMO Financial Services can provide advice on:

- GMS retirement options.
- AVCs (Additional Voluntary Contributions) and taking control of your AVC assets.
- ARFs (Approved Retirement Funds) and annuity options.
- Retirement options for your private income pension arrangements.

If you wish to speak to one of our financial advisers, please email us on imofs@imo.ie or call 01 6618299

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