- Established 1867 -

IMJ
Official Journal of the Irish Medical Organisation

Irish Medical Journal

APRIL 2013 Volume 106 ■ Number 4

IRISH MEDICAL ORGANISATION
Ceardchumann Dochtúirí na hÉireann

Urgent Care Emergencies – Avoiding the Pitfalls and Improving the Outcomes

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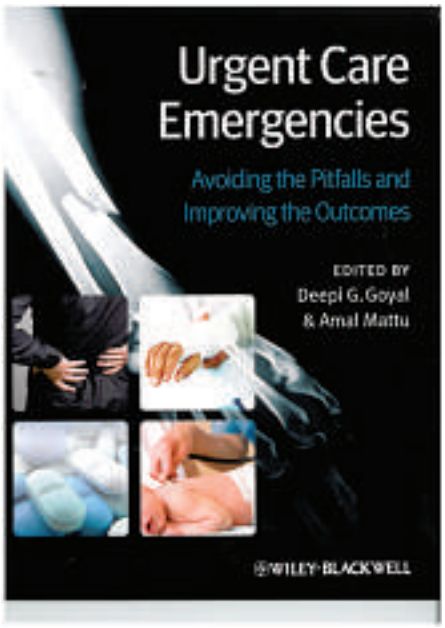
Publisher: Wiley-Blackwell

The authors of this book state that it was developed to help providers who evaluate low acuity complaints in any setting, with its aim being to highlight common pitfalls in the management of seemingly low-acuity conditions. They deliberately set out that the text was not meant to be comprehensive in scope, but rather being meant to bring the provider's attention to high risk aspects of chief complaints that may be encountered in these low-acuity settings. That, in essence, is the scope of the book, but it is one of its failings, unfortunately.

Throughout the chapters it highlights the various pitfalls that relate to clinical conditions that might be encountered in the urgent care setting, which are useful. Unfortunately, however, the book does not provide any form systematic, practical approach to the vast majority of the clinical conditions it deals with, which limits its usefulness. Highlighting the pitfalls of day to day practice, without advising of a practical and systematic approach to common clinical conditions limits this book's usefulness. A good example of the limitations of the text is contained within the first chapter, which concentrates on head, eye, ear, nose and throat pitfalls. The section on the eye concentrates, in the main, on corneal abrasions, eye foreign bodies and hyphaema, with only a cursory mention of more serious conditions which are not commonly seen (and are thus not uncommonly misdiagnosed), such as central retinal artery and vein occlusion, acute angle closure glaucoma and retinal detachment.



Whilst there are two "key facts" highlighted in this section, there is actually no highlighting of the many pitfalls that relate to these latter conditions, of which there are many. Another example of a failure to deal with important topics would be the chapter on "The evaluation and management of back pain", which makes no mention of sciatica, which is a very significant deficit for a commonly presenting problem.

Unfortunately, there are also a number of factual inaccuracies within the text. A particular example is the statement that an x-ray at 10 days, in a patient with a suspected scaphoid fracture, will reveal sclerosis i.e., healing at the fracture site. An x-ray at 10 days in a patient with a scaphoid fracture will, at best, reveal the fracture line alone, as it takes at least 4 weeks for scaphoid new bone formation to become evident radiologically. The final chapter "Talking the talk: effective communication in urgent care" is good and it is applicable to all medical practice, not just urgent care medicine. The small gems of information within that chapter obviously reflect the experience of the authors in having 'being around the block', in terms of clinical care. Another positive is that the tables, photographs, and x-rays are all generally of good quality.

Overall though, whilst there are some positive elements to this book, it has too many weaknesses for me to recommend it as a useful and practical text.

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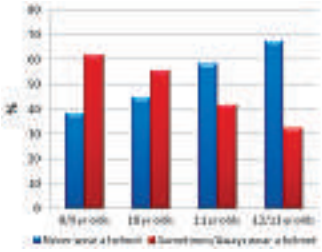
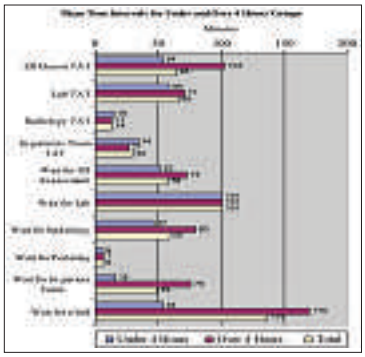
In This Month's IMJ

Bicycle Helmet Wearing in a Sample of Urban Disadvantaged Primary School Children: Quirke et al state that there are 7 deaths and 263 hospital admissions among cyclists involved in RTAs.

Children under 15 years are at greatest risk. In this study the authors found that helmet wearing was not common practice and 50% of children didn't wear a helmet. Two thirds of 12/13 year olds never wore a helmet. There was a gender difference, 61% of girls wore a helmet but only 39% of boys.



STEPS: Lean Thinking, Theory of Constraints and Identifying Bottlenecks in an Emergency Department: Ryan et al have undertaken an analysis of the factors that adversely affect patient flow through ED. Patients requiring radiology (4.4 times), patients needing blood tests (4.1 times) and patients needing admission (7.7 times) were more likely to be in ED greater than 4 hours. One of the solutions adopted at the authors' hospital has been the opening of a 12 bed acute medical and surgical assessment unit.



Prevalence of Subclinical and Undiagnosed Overt Hypothyroidism in a Pregnancy Loss Clinic: Khalid et al have examined the prevalence of subclinical and clinical hypothyroidism among women attending a pregnancy loss clinical. There were 262 women included in the analysis, the maternal age ranging from 18-47 years. The authors found that 8.39% of women had subclinical hypothyroidism and 3.05% had overt hypothyroidism. The findings support the association between hypothyroidism and pregnancy loss.

Table 1 T4 and TSH values in pregnancy loss and control groups in comparison to relevant pregnancy trimester-specific reference standards, defined as median, 2.5% and 97.5% quartiles (Reference Intervals for Children and Adults Elecys Thyroid Tests, Roche; Establishing Trimester Specific Maternal Thyroid Function Reference Intervals, Khalid et al, unpublished)

	Recurrent Miscarriage	First Trimester Control	First Trimester Reference Standard	Late Miscarriage	Second Trimester Control	Second Trimester Reference Standard	Stillbirth	Third Trimester Control	Third Trimester Reference Standard
Median T4 pmol/L	15.70	14.40	15.4	14.00	12.80	12.9	15.00	11.40	11.9
Range T4 pmol/L	11.40 – 36.30	11.62-19.24	12.05- 19.60	8.40 -19.20	10.30-16.60	9.63- 17.00	10.20- 20.20	8.30-15.59	8.39- 15.60
Median TSH mIU/L	1.60	1.08	1.48	1.69	1.60	1.52	2.13	1.59	1.42
Range TSH mIU/L	0.41- 7.46	0.11-3.25	0.33- 4.59	0.32- 6.15	0.55-3.13	0.35- 4.10	0.39- 6.35	0.55-3.91	0.21- 3.25

Factors Affecting Receipt of a Medical Card in a Cohort of Colorectal Cancer Patients: McDevitt et al have examined the factors that determine whether a patient obtains a medical card after the diagnosis of colorectal cancer. At the time of the study anybody over 70 years was automatically entitled to a medical card. During the study period 2002-2006 there were 10,284 cases of colorectal cancer. There were 4762 patients under 70 years of whom 1547 already had a medical card before the diagnosis. Of the remaining 3215 patients, 1435 (45%) subsequently were granted a medical card based on factors such as younger age, greater deprivation, the need for aggressive treatment and living in a rural area.

General Practitioners' Perspectives on Revised Entry and Selection Methods to Medicine and the HPAT: Dennehy et al have surveyed the attitudes of GPs to the HPAT, which has been part of medical school entry requirements since 2009. The majority of the 122 GP respondents had little knowledge of the HPAP. On third of the GPs disagreed with the HPAT while the majority strongly supported the Leaving Certificate as a selection tool. The respondents performed well with the 3 sample HPAT questions posed to them.

Table 1 GPs' opinions on the appropriateness of a variety of tools used for selection to medicine

Appropriateness of selection tool	Aptitude test	Leaving Cert	Interview	Personal Statement	Knowledge of the Course	Personality traits
1-strongly agree	n=17 (13.9%)	n=51 (41.8%)	n=20 (16.4%)	n=6 (4.9%)	n=11 (9%)	n=19 (15.6%)
2	n=68 (55.7%)	n=67 (54.9%)	n=47 (38.5%)	n=19 (15.6%)	n=39 (32%)	n=44 (36.1%)
3	n=19 (15.6%)	n=1 (0.8%)	n=19 (15.6%)	n=21 (17.2%)	n=18 (14.8%)	n=28 (23%)
4	n=6 (4.9%)	n=1 (0.8%)	n=13 (10.7)	n=35 (28.7%)	n=24 (19.7%)	n=15 (12.3%)
5-strongly disagree	n=6 (4.9%)	n=0 (0%)	n=17 (13.9%)	n=29 (23.8%)	n=21 (17.2%)	n=10 (8.2%)
Non responders	n=6 (4.9%)	n=2 (1.6%)	n=6 (4.9%)	n=12 (9.8%)	n=9 (7.4%)	n=6 (4.9%)

Patient Knowledge of Peripheral Vascular Disease in an Outpatient Setting: An Achilles Heel? Owens et al have assessed the level of patient knowledge about the risk factors and secondary prevention of peripheral vascular disease. Two thirds of patients were aware that smoking was an important factor. However, there was little understanding of the importance of diabetes, hypertension and hypercholesterolaemia. Increased community awareness of this condition is recommended.

Table 3 Strategies for Symptom Improvement

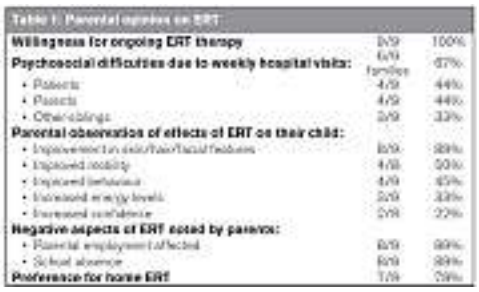
	N
Smoking Cessation	24
Exercise	35
Diet	10
Medications	4
Surgery	2
Combination of the Above	16
Don't Know	27
Other	11

Smoking in Vehicles is Lower than Mobile Telephone use while Driving, but is Socially Patterned: Gilroy et al undertook an observational study of 2230 cars to determine the frequency of smoking by drivers and passengers, and mobile phone use by drivers. Smoking was observed in only 1.36% of cars while 2.56% of drivers were observed using their phones. The authors suggest that the proposed legislation banning smoking in cars may be labour intensive for a low yield.

Table 1 Prevalence of smoking or mobile telephone use overall and according to location

Prevalence		Smoking n/N	Smoking %	Mobile Telephone Use n/N	Mobile Telephone Use %
Overall		31/2230	1.39	57/2230	2.56
Location	Booterstown	11/1146	0.96	48/1146	4.18
	Dorset Street	20/1084	1.85	9/1084	0.83
Time	Morning	11/776	1.41	26/776	3.35
	Lunchtime	8/726	1.1	17/726	2.34
	Afternoon	12/728	1.64	14/728	1.92

Parental Experience of Enzyme Replacement Therapy for Hunter Syndrome: Buraczewska et al describe the varied components in the enzyme replacement management of Hunter Syndrome. In a series of 9 cases, the authors report that following 2 years of treatment, hepatomegaly was reduced 85%, respiratory symptoms 67%, urinary glycosaminoglycan 62%. The treatment regimen placed a considerable strain on families as the children spend 7 hours weekly in hospital. The introduction of home based treatment would be beneficial.



Antibiotic Resistance is becoming a Mainstream Challenge to Public Health

The *Saturday Financial Times*[1] 16th March '13 carried a full-page article on antimicrobial resistance. The article was in response to the annual Report of Dame Sally Davies, the UKs Chief Medical Officer[2]. Her Report emphasised the growing global problem of antibiotic resistant 'superbugs'. Seven per cent of all deaths are due to infection. She warned British politicians of an 'apocalyptic scenario' of insufficient antibiotics. She also referred to it a 'ticking time bomb'. She wants the issue discussed at the next G8 Summit in London. She said that antimicrobial resistance represents a threat that may be as important as climate change for the world. Her US counterpart Thomas Frieden at the Centre for Disease Control has recently spoken about the 'nightmare bacteria', the Carbapenem-resistant Enterobacteria. One of Sally Davies concerns is the under-provision of new antibiotics. She pointed out that there hasn't been a new class of antibiotics developed since the late 1980s. She has held meetings with industry in order to stimulate new antibiotic productions. The obstacles to pharmaceutical companies developing new antibiotics are the high costs in their generation, their short term use compared with drugs for chronic conditions and the limited sales market secondary to the policy of 'saving' new antibiotics for serious infections. Andrew Witty at GlaxoSmithKline said that there is a need for greater rewards for those companies involved in the production of new antibiotics.

The banner statistics are alarming. It is estimated that 25,000 patients die annually in the EU from drug-resistant bacteria. These serious infections are costing billions of Euros in terms of additional healthcare. The rise in international travel has facilitated the spread of resistant organisms. It would appear that concerns about antibiotic resistant infections have spread beyond the academic corridors of microbiology and have now reached everyday clinical practice and the public consciousness. There are multiple reasons for the development of resistance. There is an excessive and ill-controlled use of antibiotics particularly for viral infections. In many EU countries medications can be obtained without a doctor's prescription. The use of antibiotics in animal husbandry is also a concern in the development of cross-resistance.

Resistant microorganisms are those that are not inhibited by antibiotics. The resistance to treatment starts as a random mutation in the bacteria's genetic code. Antibiotic resistance has steadily increased since systemic antibiotics were introduced in the 1930s and 1940s. The new concern, however, is the breath of resistance and the shortage of new antibiotics being produced. Increased numbers of critically ill susceptible patients are being nursed in close proximity in our intensive care units. The real danger is the gram-negative Enterobacteriaceae such as *E.Coli* and *Klebsiella*. *E.Coli* alone accounts for 36% of bacteraemias. Multi-resistant *E.Coli* septicaemia has a 30% mortality while the mortality is 15% in those with a susceptible *E.Coli*. Extended Spectrum Beta Lactamase (ESBL) producing organisms are causing increased concern. These organisms produce a lactamase capable of breaking the beta lactam ring of the antibiotic when deactivates its efficacy. An ESBL-producing E Coli strain, which is more difficult to treat than MRSA, affects 30,000 patients annually in the UK. The first case of ESBL presented 4 years ago. ESBL producing antimicrobials are resistant to cephalosporin antibiotics.

A typical large 1,000 bed acute hospital will have 500 bacteraemias involving Gram-negative bacteria, 15% being multiple antibiotic resistant. In addition there will be 60 cases of *C.difficile* and 3 cases of *MRSA*.

The concept of antimicrobial stewardship is being widely promoted. Its goals are the optimal use of antibiotics for the individual patients, the prevention of overuse and to minimise resistance at patient and community levels. The problem is how to balance between the appropriate early use of antibiotics in the face of potentially severe infections and the inappropriate use of antibiotics for minor illnesses. The first step is the institution of antibiotic guidelines in all hospitals which should avoid broad-spectrum antibiotics where possible. Try to avoid antibiotics that lead to multi-resistant bacteria or *C.difficile*. The justification for the commencement of the antibiotics should be entered in the case notes. Blood culture and all other appropriate swabs should be taken before commencing therapy. Prescribe the shortest, effective course. One of the limitations that diagnostics other than the blood culture such as C-reactive protein and white cell counts lack specificity. During the period awaiting the blood culture the treatment is a 'best guess'.

There have been a number of gains and successes in the area of infection prevention. There has a welcome reduction in the number MRSA bacteraemias. In England in 2011 there was an 84.7% reduction in MRSA septicaemias compared with 2004, 1,185 cases compared with 7,700 cases. Since 2008 the *C.difficile* cases have reduced by 53%. This has been achieved by a number of measures. There has been a concerted effort to improve hand washing. The 5 moments of hand washing developed by the WHO are- before touching the patient, before a clean or aseptic technique, after body fluid exposure risk, after touching a patient, after touching the patient's surroundings. There has also been a major drive to prevent medical device infections. he prevention of catheter-related bloodstream infection has been spearheaded by Peter Pronovost[3] and his team at Michigan. He demonstrated that meticulous line care can reduce line infection by 60%. The bundle of interventions now considered a standard of care are hand washing, use of chlorhexidine for skin antisepsis, use of maximum sterile precautions for catheter insertion and dressing changes, avoidance of the femoral vein and prompt removal of unnecessary catheters.

Vaccines have played an important role for children. The Streptococcal pneumonia vaccine has been effective in reducing invasive infections including pneumonia, meningitis.

In Ireland the Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) was established in 2001. For over a decade it promoted the prudent use of antibiotics, surveillance and infection control. The HIQA infection control standards were launched in 2009. In 2011 SARI handed over its functions to the National Health Care Associated Infection (NHAI) Clinical Programme. The primary aim is the prevention and control of antimicrobial resistance and healthcare associated infection. It measures compliance with standards. The Programme's workstreams include hand hygiene, hospital antimicrobial stewardship, medical device infection prevention and avoidance of surgical site infection. There is an emphasis on guidelines for the large scale usage of antibiotics conditions such as urinary tract infection. The use of antibiotics in long term facilities is also being addressed. There are public education activities such as 'antibiotics don't cure colds or the 'flu', European antibiotic day, and WHO hand hygiene day.

It is clear that concerns about antibiotic resistant bacteria are increasing. It is now a public health issue. The relative paucity of new antibiotics means that the emphasis must be on infection control and prevention. In children a comprehensive, effective vaccination is of paramount importance. The Report of Sally Davies has added a new stimulus for all those involved in the process. One of the final comments in her Report is that in the last 50 years we had a wide array of agents to fight infection but the next 50 years may be very different with the emergence of highly resistant bacteria.

JFA Murphy
Editor

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Managing Physical Health in Mental Health Populations

People with serious mental illness (SMI) have greatly increasing morbidity and mortality from physical illness than the general population. This results in a 25 to 30 year shorter life expectancy with cardiovascular disease being the leading cause of death[1]. It has been suggested that current policy, services and health promotion actions are ineffective in targeting physical illness in this population.

Vulnerabilities for Physical Health Difficulties

Excess mortality seen in the psychiatric population reflects multiple vulnerabilities and risk factors including poverty, unemployment, being single and marginalised have been reported. Lifestyle risks include a poor diet, increasing smoking and substance abuse rates and lower levels of exercise[2]. Although there may be a genetic predisposition to develop metabolic abnormalities in schizophrenia, the impact of negative symptoms of illness such as difficulties in concentration and memory and a lack of motivation is also significant[3]. This is compounded by the finding that people with mental illness have inadequate access to good quality physical healthcare and that they receive poorer treatment for physical disorders ('diagnostic overshadowing') than the general population[4]. The potential of antipsychotic medications to cause significant weight gain and other metabolic side effects leaves this population at high risk of physical illness.

Targeting Physical Health

The chief risk factors for mortality are lipid abnormalities, diabetes, high blood pressure, smoking, physical inactivity, obesity and stress[5]. A recent review found that the top modifiable risk factors for premature mortality could be lowered in patients with schizophrenia[5]. The dilemma for health care services lies in the differing focus between physical and mental health providers, and the finding that those with mental health problems do not attend to their physical health. There are clear benefits to monitoring and managing risk factors for physical illness. It is argued that patients with serious mental illness are less capable than other patients of interpreting physical signs of ill health, suggesting the need for an increased role for either primary or secondary care to monitor the physical health needs of these patients[4].

NICE guidelines acknowledge the risk of increased physical morbidity and mortality in individuals with schizophrenia and recommends routine monitoring of these risks. They advise that health promotion advice be offered on smoking, alcohol, drug use and exercise[3]. The guidelines further state that individuals taking atypical antipsychotic medication should be offered a comprehensive package of care that addresses clinical, emotional and social needs. In bipolar disorder, the British Association for Psychopharmacology has produced guidelines that emphasise the medical need to assume responsibility for physical examinations to advise patients to maintain normal levels of exercise and moderate calorie intake[3]. "The 2009 Schizophrenia PORT Psychosocial Treatment Recommendations and Summary Statements" recommend a three month psychosocial treatment for weight loss management in those who are overweight or obese[6]. This intervention should include psychoeducation focused on nutritional counselling, calorie expenditure and portion control; behavioural self management including motivational enhancement; goal setting; regular weigh-ins; self-monitoring of daily food and activity levels; and dietary and physical activity modifications[1,7]. Furthermore, where psychiatric patients have or are at risk of metabolic syndrome, weight-neutral psychotropic medications are recommended.

Clinical Research

The guidelines currently advise psychiatrists to routinely evaluate the risk factors associated with metabolic syndrome. The few interventions that exist combine elements of health screening, education and promotion with behavioural initiatives; however, the empirical evidence to support these is weak. Lifestyle programmes have been described as a cost-effective way of providing education about lifestyle changes to improve physical health and mental well-being, however, the use of exercise programmes with patients as an adjunct therapy in clinical practice remains limited. More importantly, the question of how these strategies might be disseminated and implemented across diverse clinical settings and patient populations has not been addressed.

The Future

In order to address the physical needs of those with serious mental illness there should be a greater focus on physical health assessment and health promotion within the multidisciplinary team. This approach will need to primarily address patient engagement and sustained motivation but should also include a major support role for carers as well as primary and secondary health care workers and incorporate health service and health promotion initiatives specific to this population and their needs. The current evidence is that while most patients will accept entry into an appropriate programme, engagement with the intervention is not sustained[2]. Yet, in light of the significant risks to physical health it is incumbent on all health professionals, perhaps even our ethical and moral responsibility, to find a way of encouraging people with mental illness to participate in and to complete physical health interventions. The role of motivational interviewing may be central to success in this population and such initiatives will likely need to build in components to address self esteem and confidence as an initial step towards engagement. As with most illness and health initiatives, prevention may be more beneficial than cure.

The research to date illustrates the increased morbidity and earlier mortality of people with mental illness[1]. A number of modifiable risk factors have been identified, some similar to those in the general population and some illness specific and complicated by the metabolic side effects of medication[1]. Managing physical health poses a significant challenge to frontline mental health staff and providers. The current guidelines do not give specific recommendations on evidence based physical health interventions nor do they address how interventions should be tailored to meet the specific needs of these populations who in addition to facing the motivational challenges of healthy individuals, they often struggle with negative symptoms of their illness. Further research and evaluation in this area is urgently needed to enable the development and delivery of a multidisciplinary and evidence-based intervention for patients and families that focuses on prevention and screening as well as management. The longer term human and health care saving could be immense.

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Acknowledgements

The Physical Health and Wellbeing Group St John of God Hospital supported by a St John of God Research Grant.

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Bicycle Helmet Wearing in a Sample of Urban Disadvantaged Primary School Children

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Abstract
Bicycle helmet wearing is currently not legally enforced in Ireland and little is known about the self-reported practice amongst young children. The principal aim of this study was to assess self-reported helmet wearing amongst a sample (n=314) of primary school children (aged 8-13 years) attending disadvantaged schools in Dublin. Approximately 86% of the sample owned a bike and provided a response to the question on helmet use. The findings indicate that helmet wearing is not a widespread practice (50.4%; 136/270 report never wearing helmets). As children get older, reported practice is also less likely with 67% (27/40) of 12/13 year-olds compared to 38% (31/81) of 8/9 year-olds reporting never wearing protective headgear. Regardless of age, more girls (61%; 82/135) than boys (39%; 52/135) indicated always/sometimes using helmets when cycling. Conversely, the findings show that (mandatory) seatbelt wearing is standard practice for the majority (93%; 252/270). The findings relating to helmet wearing add further to the debate around the mandatory introduction of protective headgear for cyclists.

Introduction

The UK Department of Transport[1] identified that, in 2008, 115 pedal cyclists were killed and 2,450 seriously injured on roads in Britain. In the Republic of Ireland, 7 road bicycle deaths were recorded during the same year whilst, according to a Health Service Executive report[2], an approximate average of 263 cyclists were admitted annually to hospital with accident related injuries during 2005-2008. Hospital costs for these cases have been estimated at over one million euro per year[2]. According to Elke and Elvik[3], children under fifteen are at greatest risk of serious injury through cycling-related accidents. At present, however, there is no regulatory enforcement of helmet wearing for cyclists of any age in the Republic of Ireland.

There is ongoing debate about the effectiveness of helmet wearing in reducing the risk of head injuries amongst cyclists[1,4-6]. In the Republic of Ireland, several medical and safety organisations have consistently argued for compulsory protective headgear. For example, the Irish Medical Council[7] argues that mandatory usage can reduce the incidents of bicycle-related head injuries whilst the Irish Road Safety Authority[8] also promotes the use of bike helmets by all cyclists. To support their position, the RSA[8] present evidence from two well known, albeit now dated, studies[9,10] which conclude that wearing a helmet may reduce the risk of head injury by 69%-85%. Furthermore, a more recent review of the literature by the UK Department of Transport[1], concludes that, overall, the use of properly fitted and correctly used helmets is expected to "be effective at reducing the risk of head injury, in particular cranium fracture, scalp injury and intracranial (brain) injury" (p1). However, other recent research suggests that any association between bicycle helmet wearing and risk reduction may not be so clear-cut[4,6,11]. Many cycling associations argue strenuously that, where such laws have been introduced, they have not been proven to reduce head injuries, but may instead, merely reduce the number of cyclists on the road[12]. Other critics of mandatory enforcement highlight research evidence to suggest that the improper use of helmets may increase the risk of other related injuries such as strangulation[13].

As this debate continues, there is still very little data available on the helmet wearing practices of young children in Ireland and associated risk factors[14]. Therefore, the principal aim of this study was to assess self-reported helmet wearing by a sample of primary school children and to explore factors which influence reported use.

Methods

Children from 7 designated urban disadvantaged schools were invited to participate as part of a larger assessment of children's health behaviour[15]. Adapted versions of the self-report Health Related Behaviour Questionnaire[16] and a Health Related Quality of Life measure, the Kidscreen-27[17], were completed by the participants (n=314). Questionnaires were completed in the school setting in small groups with the research team present. The questionnaire was explained to the students using age appropriate language and children were provided with additional support to complete the questions when requested. The study was conducted in accordance with the Psychological Society of Ireland Professional Code of Ethical Conduct and ethical approval was granted by Trinity College Dublin Health Sciences Ethical Committee. Questions relevant to the current study were extracted and data were analysed using PASW[19].

Results

Participants were aged 8-13 years (mean=10.27, standard deviation=1.23) and 48% were female. A little over 86% (271/314) indicated that they owned a bike and of these 270 provided a response to the question on helmet wearing. More than one in five of this subsample (22%, 59/270) reported always wearing a helmet compared to 28% (75/270) who indicated that they only did so some of the time. However, half (136/270) reported never using protective headgear when cycling. More than one third (38%, 103/270) reported cycling more than three times a week although a little less than 5% (13/270) indicated they usually cycled to school. Chi-square analysis indicated no significant association between frequency of cycling and reported helmet wearing (c^2(2, n=268), p=.46, phi=.07). Comparisons across age groups indicated that older children were less likely to report wearing a bike helmet. For example, approximately two-thirds (67%, 27/40) of 12- and 13-year-olds reported never wearing a helmet compared with 38% (31/81) of 8- and 9-year–olds (Figure 1). Chi-square analysis revealed that this

proportional change differed significantly across age groups [(3, n=270)=12.4, p=.006, phi=0.22], showing a decrease in reported helmet wearing as children got older, albeit with only a small to moderate effect. Regardless of age, more girls (61%; 82/135) than boys (39%; 52/135) indicated always/sometimes using helmets when cycling.

The responses to a similar question on seatbelt-wearing showed, by contrast, that 93% (252/270) reported that they always wore a seatbelt whilst only one child said that they never wore a seatbelt when in the car. No differences emerged between genders or across age groups. A direct logistic regression analysis was conducted to assess the relationship, if any, between wearing a bicycle helmet (yes or no) and several possible predictors or risk factors including: age; gender; frequency of cycling; frequency of seat belt wearing; and a measure of parental support as measured from the Kidscreen-27. The model was statistically significant ($c^2(9, n=268) = 40.79$, $p<.001$) and was therefore, able to distinguish between those who did/did not wear a bicycle helmet. The model as a whole explained between 14% (Cox and Snell R square) and 19% (Nagelkerke R squared) of the variance in helmet wearing, and correctly classified 67% of cases; therefore, it was adequate, for assessing possible predictors. The analysis revealed that only age and gender were significant predictors ($p<.001$) of helmet wearing thereby supporting the results observed within the descriptive statistics.

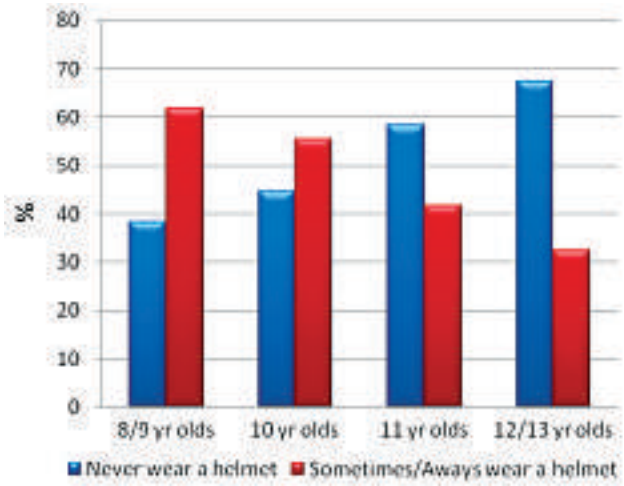

Figure 1 Proportion of children by age group who reported wearing a bicycle helmet

Discussion

The findings indicate that helmet wearing is not a widespread practice whilst children are also less likely to report wearing a helmet as they get older. In addition, females were more likely to report wearing protective headgear. Conversely, the data show that seatbelt wearing is standard practice for the vast majority regardless of age. Few findings are currently available on reported practices of helmet wearing amongst younger children aged 8-12 years. A review of bicycle safety data in Norway during 2006[3] found that approximately 63% of children under 12 years wore helmets when cycling compared with approximately half of the current sample (who reported always or sometimes wearing one). However, both our study and the Norwegian research, indicate a much higher prevalence of helmet wearing amongst children under 12 years when compared to a 2002 Irish study which examined reported use by children aged 10-17 years[14]. This National Health and Lifestyle Survey (NHLS) report[14] indicated that only 8% of the respondents (n=5712) reported wearing bicycle helmets. Similarly, the UK Department of Transport[1] in 2009 estimated a practice rate on major roads of approximately 17% amongst children aged 7-16 years which, whilst higher than the NHLS study, is much lower than found amongst the sample in the current study.

Erke and Elvik[3] showed that, as children get older, helmet wearing decreased from almost two-thirds of 5 to 11-year-olds to one quarter of 12 to 17 years-olds[3]. This is comparable to the pattern of decline identified in the current study where the proportions of helmet wearers reduced from 62% of 8 to 9-year-olds to approximately one third of 12–year-olds. A similar inverse pattern, albeit based on a much lower reported practice overall, emerged in the National Health and Lifestyle survey[14] where helmet wearing decreased from 14% of 10 to 11-year-olds to only 5% of 15 to 17-year olds. On the positive side, it is reassuring to note that reported seatbelt wearing in the current study is much higher than the 80% of primary school-aged children estimated by the Road Safety Authority to wear a seatbelt[18]. Indeed, the current findings are more consistent with a UK study by the Department of the Environment where 96% of children were found to wear restraints[19].

This study was conducted as part of a larger evaluation of a health promotion initiative in seven schools located in Dublin. The study is exploratory and has several limitations. Firstly, there may be a number of reasons for the low level of reported bicycle helmet wearing in this sample. For example, the children were attending schools located in areas characterised by high levels of disadvantage. Thus, factors such as cost (or availability) may have impacted the practice of helmet wearing. This issue supports the concern from some quarters, that the mandatory enforcement of protective headgear may decrease the number of cyclists rather than increase the number of helmet wearers[4,11,12,22]. Some agencies have attempted to address these difficulties by introducing subsidised, or free, helmet schemes[20]. Secondly, the use of self-report measures in the current study raises questions about social desirability. For example, an interesting study by Schieber & Sacks[23] examined both observed and reported practice from the Oregon Behavioural Risk Factor Surveillance System survey and found that children were less likely to report 'always' wearing a helmet (15%) than when observed directly (at 20%). However, whilst "different absolute estimates" were recorded, across time, similar degrees of change were also found[23]. Social desirability is a legitimate concern in any self-report study. However the difference found in reported seatbelt wearing versus helmet use may suggest that there is at least an increased awareness of the importance of seatbelt wearing in cars and perhaps a lower level of social pressure regarding bicycle helmet use. In addition to examining other possible predictors impacting helmet use, future research could also explore further the differences in legislated safety versus voluntary practices amongst children to identify whether seatbelt and bicycle helmet wearing are comparable and if mandatory enforcement underpins differences in reported practice.

It has been acknowledged that helmets are only useful if headgear is of high standards and is worn correctly[5,23,24]. Helmets have also been found to only protect from certain types of direct impact head injuries and hence, their limitations also need to be acknowledged[5]. Prior to the introduction of such schemes to support mandatory wearing, proponents of both sides of the debate have argued that cost-benefit analysis may provide a useful tool to identify the effectiveness of introducing such legislation[21,22].

In Ireland, helmet wearing is promoted by both the RSA[8] and the IMO[7] as good cycle-safety practice and it is worth noting, in this context, that cycling helmets have just been included as a new addition to the 'basket of goods' used by the Central Statistics Office[25] to compile its new five-yearly Consumer Price Index. This would appear to indicate that consumers/cyclists are indeed changing their cycle safety practices, although our findings suggest that promotional efforts should be targeted at children as well as adults. However, additional large-scale research is needed, both to examine more diverse samples of children in Ireland and elsewhere and to elicit more detailed information regarding the views and experiences of children and their parents in relation

to cycling and other health and safety behaviours. Further research should also explore how parental-perceived awareness and acceptance of legally enforced versus voluntary practices, affects their children's overall awareness of, and adherence to, appropriate cycle safety.

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Acknowledgements
The children, parents, teachers and principals who very kindly consented to be involved in the study. This study was part of a larger evaluation research project commissioned by the Childhood Development Initiative (CDI) for Tallaght West and funded by the Atlantic Philanthropies and the Office of the Minister for Children and Youth Affairs (OMCYA).

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STEPS: Lean Thinking, Theory of Constraints and Identifying Bottlenecks in an Emergency Department

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Abstract
This study aimed to identify the bottlenecks in patients' journeys through an emergency department (ED). For each stage of the patient journey, the average times were compared between two groups divided according to the four hour time frame and disproportionate delays were identified using a significance test. These bottlenecks were evaluated with reference to a lean thinking value-stream map and the five focusing steps of the theory of constraints. A total of 434 (72.5%) ED patients were tracked over one week. Logistic regression showed that patients who had radiological tests, blood tests or who were admitted were 4.4, 4.1 and 7.7 times more likely, respectively, to stay over four hours in the ED than those who didn't. The stages that were significantly delayed were the time spent waiting for radiology ($p=0.001$), waiting for the in-patient team ($p=0.004$), waiting for a bed ($p<0.001$) and ED doctor turnaround time ($p<0.001$).

Introduction

Overcrowding has become a problem in emergency departments (ED) in Ireland, primarily due to exit block. It can compromise clinical care, patient access, patient satisfaction, patient dignity, staff morale, surge capacity, safety, cost efficiency, teaching and research[1-6]. In the UK, the National Health Service (NHS) set a target to achieve the disposition of 98% of patients within four hours of arrival at an ED[7]. In Ireland a target of 6 hours has been adopted[8]. The international literature has identified a number of ways to alleviate ED overcrowding and facilitate flow by tackling input, throughput and output factors[1,9]. The choice of intervention depends upon which delaying factors are particular to the ED and the improvement process should begin by identifying exactly what these delaying factors are.

Lean thinking and Theory of Constraints (TOC) are process improvement methodologies that aim to facilitate flow. These methodologies can be applied successfully to the unpredictable needs of healthcare[10-12]. They have both been used successfully in the NHS[13-16] and in EDs elsewhere[17,18]. In TOC terminology, according to Umble and Umble, the work being processed through a healthcare system can be defined as the patients themselves[15]; so there are constraints wherever patients are found in queues. While TOC aims to increase the throughput by focusing on the main constraint in the system[11,19], lean thinking aims to reduce the flow time by reducing waste at every point throughout the process[10,19]. The five focusing steps tool (5FS) provides the foundation for the TOC improvement process and the first of these five steps is to identify the constraints[11]. The remaining four steps are to exploit the constraint, to subordinate everything else, to elevate the performance of the constraint, and to identify the next constraint. The aim of this study was to identify and prioritise the bottlenecks in the patient's journey through the ED in a regional general hospital from the time of arrival to the time of admission or discharge by using a method based on the NHS four hour rule[7] and a significance test.

Methods

Process maps of patients' journeys through the ED and Radiology Departments and of their blood samples through the Pathology Department were developed in consultation with staff. Based upon this, a value-stream map[10] was drawn. Following this, patients who were seen by an ED doctor during a seven day period in June 2006 were tracked from initial registration to their disposition (admission or discharge from ED). Non-routine data were collected for this study by hospital staff using data collection sheets attached to the patient's clinical notes and x-ray request forms. The UK four hour target was used for the purposes of this study to split the sample into two groups with patient journeys of under and over four hours; i.e. between patients who were seen and managed in a timely manner (under four hours) and those whose journey through the ED could be considered 'too long' (over four hours).

The sample size calculation estimated that a sample size of 400 subjects would be required to detect a difference of 20 minutes total ED journey time (i.e. 15% difference) between the two groups with a power of 90% and at a 5% significance level. The population under study was defined as the total number of patients seen in the ED during the calendar year 2005, i.e. 29,412 patients. In 2005, there were on average 80 ED attendances per day at Sligo General Hospital (29,412/365=80). At this rate of attendances it would take five days to achieve 400 attendances. It was decided to extend the study period to seven days to overcome the expected problem of missing data. In this study, the term 'turnaround time' (TAT) is used to describe the time a healthcare worker spends with the patient from the start of the assessment or investigation to the finish. This does not include the time from the request for assessment to the start of the assessment which is termed the 'wait'.

The SPSS (version 14) statistical software package was used for analysis. All variables found to be significant predictors on univariate analysis (Pearson Chi-square tests) were included in a logistic regression model and backward stepwise logistic regression analysis performed using likelihood ratios. This was carried out to establish which variables were predictive of total journey times longer than four hours. In order to identify where bottlenecks appeared when the system was under pressure, each stage of the journey was compared between the two groups. The assumption was that when a patient's total journey time exceeds four hours, the time intervals at the bottlenecks would stretch to a greater degree than the stages that are not bottlenecks. By definition, some time component was going to be longer in the over-four-hour group, however, the aim was to see if some segments of the patient's journey lengthened disproportionately while others stayed the same. Mann-Whitney tests were used because data were not normally distributed.

Results

During the study period, a total of 599 patients passed through the ED, of whom 336 (56.1%) were males and 263 (43.9%) were females. The disposition time was non-routine data that was collected manually for 434 (72.5%) patients so the total patient journey time could be calculated for these patients only (72.5% of total). The remaining 165 patients (27.5%) left the ED without the time being recorded. Of the 434 patients, the total patient journey from registration to admission or discharge took under four hours for 321 (74%) patients and over four hours for 113 (26%) patients. Of the total sample of 599 patients, laboratory tests were ordered for 190 (31.7%) patients and radiological tests were ordered for 332 (55.4%) patients. One hundred and

nineteen (19.9%) patients had both laboratory and radiological tests.

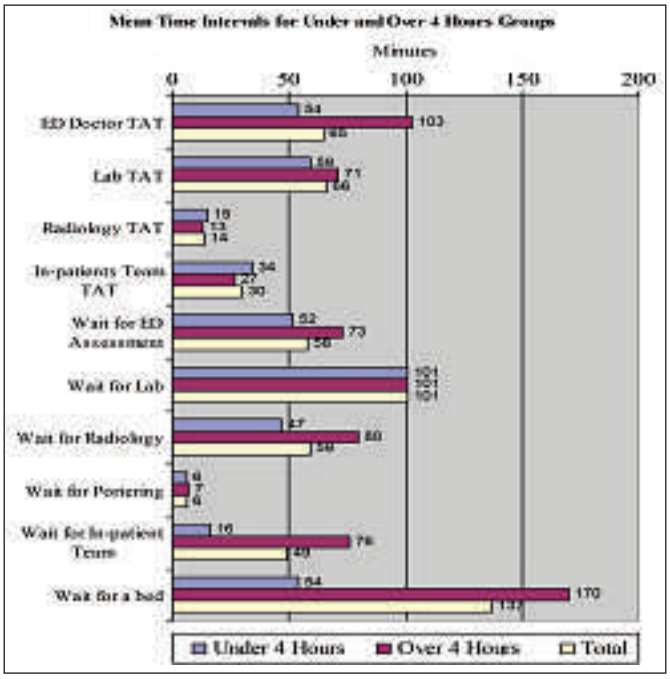

Figure 1 Mean time spent in each stage for the under and over four hours groups

Logistic regression was carried out to identify which factors were associated with patients who were more likely to stay more than four hours in the ED. It showed that patients who had radiological tests were 4.4 times more likely to stay over four hours in the ED than those who didn't; patients who needed blood tests were 4.1 times more likely to stay over four hours in the ED; and those who were admitted were 7.7 times more likely to stay over four hours in the ED. The time interval for each stage of the patient's journey is compared for the under and over four hours groups in figure 1.

Table 1 Comparison between the mean time intervals in the two four-hour groups in minutes

Time Interval (Journeys measured/ Total journeys)	Under 4 Hours (Range)	Over 4 Hours (Range)	Overall Interval Time	Significance Mann-Whitney (P value)
ED Doctor TAT (232/434)	54 min (0-260)	103 min (0-510)	65 min (0-510)	<0.001*
Lab TAT (123/130)	59 min (16-242)	71 min (12-396)	66 min (12-396)	0.2
Radiology TAT (126/237)	15 min (0-61)	13 min (3-72)	14 min (0-72)	0.1
In-patient Team TAT (28/156)	34 min (4-145)	27 min (0-65)	30 min (0-145)	0.9
Wait for ED Doctor Assessment (280/434)	52 min (0-175)	73 min (0-255)	58 min (0-255)	0.1
Wait for Lab Results (54/130)	101 min (41-301)	101 min (30-242)	101 min (30-301)	0.6
Wait for Radiology (82/237)	47 min (10-155)	80 min (16-225)	59 min (10-225)	0.001*
Wait for Portering (60/98)	6 min (0-40)	7 min (0-20)	6 min (0-40)	0.7
Wait for In-patient Team(38/156)	16 min (0-60)	76 min (0-245)	49 min (0-245)	0.004*
Wait for a Bed (53/117)	54 min (1-130)	170 min (6-474)	137 min (1-474)	<0.001*

TAT= Turnaround time. *Significant

There was a significant difference in the mean times between the under and over four hours groups in four variables: wait for radiology, wait for the in-patient team, wait for a bed and the ED doctor TAT (Table 1). A value-stream map of the patient journey was developed, (Fig 2). The value adding stages are placed above the line and the non-value adding stages below the line[10]. The non-value adding stages of the patient's journey are the periods spent waiting for medical assessment (by ED doctor or in-patient team), for diagnostics (X-ray or laboratory) or for a bed.

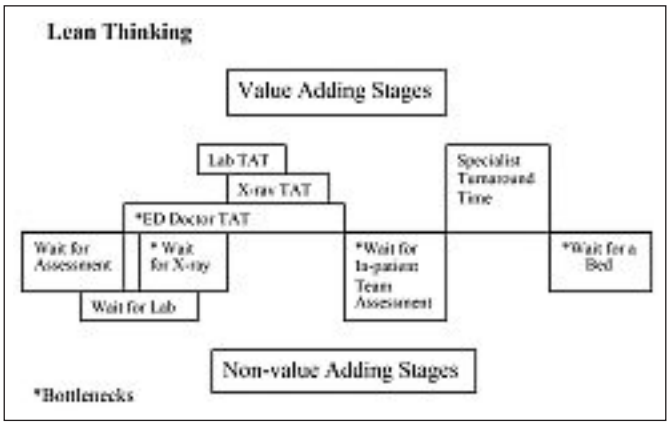

Figure 2 Value-stream of the ED patient journey

Discussion

The lean thinking value stream map in (Figure 2) shows how the non-value adding stages overlap with the bottlenecks identified in this study. The bottlenecks were identified as the four stages in the patient's journey that were significantly longer in the over-four-hours group. These were the ED doctor TAT; the wait for radiological tests; the wait for assessment by an in-patient team and the wait for a bed. Since the ED doctor TAT stage incorporates the time spent waiting for diagnostics results to come back and since that may be where the true delay occurred, this bottleneck was not included in the prioritisation process. The remaining three bottlenecks can be prioritised by looking at the significance test results. The most significant difference seen between the two four-hour groups was in waiting for a bed which had a p value of <0.001. This was followed by wait for radiology and then by wait for in-patient team assessment.

Lean thinking and TOC both aim to facilitate flow. According to the core lean thinking principles[10], flow can be facilitated by minimising or eliminating all of the non-value adding stages (Figure 2), but it is not clear from the value stream map which non-value adding stage should be addressed first. The TOC approach to this question is to identify the most restricting bottleneck (the "constraint") and to address this first. The methodology used in our study allows the identification of which stages expand disproportionately when a patient is delayed i.e. which services become bottlenecks when the system is under pressure. These bottlenecks can also be quantified which helps to prioritise which bottleneck should be addressed first and provides an evidence base to support any such change project. Once a bottleneck is freed, some other stage in the system will emerge as a new bottleneck and this may be unpredictable and not immediately apparent. If the ED has a fit-for-purpose information system in place, then the impact of the change can be evaluated and the next bottleneck can be prioritised.

Since this study was carried out, a number of process changes have occurred in this hospital. A twelve-bed Acute (Medical and Surgical) Assessment Unit has been opened. This unit shares a common entrance with the ED as recommended in the Acute Medicine Programme [section 5.5][20]. The introduction of both the Integrated Patient Management System (iPMS) and the National Image Management Information System (NIMIS) allow the Radiology Department to co-ordinate work-flow with other departments. Efforts have been made to free medical in-patient teams from out-patient department duties while on-call and an increasing number of nurses in the ED are now authorised to request x-rays.

This study was limited in that it examined patient factors only, ED factors such as workload and rostering were not examined.

Two other limitations stemmed from the fact that non-routine data had to be collected i.e. missing data and performance bias. It was assumed in the analysis that there was no systematic pattern in the missing data. The staff were aware that this study was being carried out and this may have led to performance bias. This study combined the four hour timeframe with a significance test to identify the bottlenecks in the patient journey through the ED. This four hour timeframe methodology pinpointed and quantified the bottlenecks by showing which steps stretch out and cause delays for patients and which steps seem to remain the same regardless of how long the patient spends in the ED. The bottlenecks were long waits for radiology, for in-patient team assessment and for an inpatient bed. Both lean thinking and TOC informed the interpretation of these bottlenecks and the implementation of improvement measures.

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Acknowledgements
All the staff in Sligo Regional Hospital who collected data and to all the staff in the Department of Public Health Medicine HSE-West (Northwest).

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Prevalence of Subclinical and Undiagnosed Overt Hypothyroidism in a Pregnancy Loss Clinic

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Abstract
Recent studies have associated pregnancy loss with subclinical hypothyroidism, defined as elevated thyroid-stimulating-hormone level, with normal free thyroxine. In overt hypothyroidism, the free thyroxine is low. Subclinical and overt hypothyroidism occurs in 0.25-2.5% and 0.2-0.3% of pregnancies respectively. We examined the prevalence of subclinical and undiagnosed overt hypothyroidism in women with recurrent miscarriage, late miscarriage and stillbirth attending the Pregnancy Loss Clinic. Data was collected from the Pregnancy Loss Clinic records. Women with sporadic miscarriages, autoimmune disorders, thrombophilias and known hypothyroidism were excluded. Two-hundred-and-sixty-two women were included. Median maternal age was 35 years (range 18-47). Subclinical and undiagnosed overt hypothyroidism was found in 11.45% of women. Twenty-two women (8.39%) had subclinical hypothyroidism, eight (3.05%) had undiagnosed overt hypothyroidism. Results were compared to women with ongoing pregnancies. A proportion of women attending the clinic had subclinical or undiagnosed overt hypothyroidism, raising the suspicion of causation in unexplained pregnancy loss.

Introduction

Hypothyroidism is the second most common endocrine disorder in women of childbearing age and has long been associated with an increased risk of pregnancy loss. Recent interest has focused towards the relationship of subclinical hypothyroidism with pregnancy loss. Subclinical hypothyroidism is defined by elevated thyroid stimulating hormone (TSH), with normal free thyroxine (T4) levels. In overt hypothyroidism, free T4 is low. Thyroid autoimmunity is defined as the presence of thyroid antibodies regardless of thyroid status. The prevalence of overt hypothyroidism, subclinical hypothyroidism and thyroid autoimmunity in pregnancy is 0.3-0.5%, 2-3% and 5-15%

respectively[1]. All rates are increased in women with pregnancy loss[2-6].

The alteration in thyroid hormone regulation in pregnancy due to the increase in plasma volume expansion, the increase in thyroid binding globulin (TBG) caused by human chorionic gonadotrophin (HCG), and the relative iodine deficiency in pregnancy, results in a 10-15% lower free T4 level compared to non-pregnant women[7]. The demands of thyroid hormone, however, increase due to the initial increase in TBG, the thyrotropic action of HCG, which causes an increase in TBG and free T4 and alterations in thyroid metabolism, particularly at placental level at later gestation[7]. Failure to adapt to these changes result in subclinical, or even overt hypothyroidism in normally euthyroid women. Maternal hypothyroidism is associated with adverse pregnancy outcome, including pre-eclampsia, preterm delivery, placental abruption and fetal death[1-6,8-13]. Fetal thyroid gland forms from week 7 of gestation, and structurally matures at 17 weeks. Until the fetal thyroid produces sufficient endogenous thyroid hormone, the fetus depends on maternal thyroid hormone for its development[14].

The incidence of pregnancy loss is 15-20%[24]. Recurrent miscarriage, defined as at least three consecutive miscarriages, occurs in 1% of women[24]. Late miscarriage, or mid-trimester miscarriage, defined as miscarriage between 14-24 weeks of gestation, occurs in 1-5% of pregnancies. Stillbirth occurs in 1 in 200 pregnancies. Both overt and subclinical hypothyroidism are associated with pregnancy loss, though the causative mechanisms remain unclear. Untreated hypothyroidism can cause anovulatory cycles resulting in subfertility. Even after conception, there is an increased prevalence of miscarriage[14,15]. Furthermore, hypothyroidism is more common in women aged 35 and above, when the risk of miscarriage also increases. Three proposed hypotheses for the association of thyroid autoimmunity and pregnancy loss are; firstly, it may reflect a generalised activation of the maternal immune system, secondly it delays conception, therefore increasing the risk of miscarriage due to older maternal age and thirdly, it may reflect a subtle deficiency in thyroid hormone[16].

In overt hypothyroidism, treatment with levothyroxine is known to alleviate maternal symptoms and improve pregnancy outcome[8]. In subclinical hypothyroidism, the evidence for treatment is lacking. However, The Endocrine Society Clinical Practice Guidelines concluded that there is benefit to treatment, with low incidence of adverse outcomes, and therefore advocated levothyroxine treatment in subclinical hypothyroidism[1]. Levothyroxine requirements in patients with overt hypothyroidism increase from early first trimester and the dosage of levothyroxine may need to be increased 30-50% by 4-6 weeks gestation[1,17,18]. A target level of TSH less than 2.5μU/mL is recommended[4]. In subclinical hypothyroidism, the recommended timing of intervention and dosage remains unclear. We aimed to examine the prevalence of both overt and subclinical hypothyroidism in women with pregnancy loss.

Methods

We conducted a retrospective analysis of thyroid function tests (TFT) in women attending the Pregnancy Loss Clinic (PLC) between January 2008 and December 2009. The PLC in Cork is attended by women with a history of recurrent miscarriage, late miscarriage, or perinatal death. Women with two consecutive first trimester miscarriages with no prior successful pregnancies are also accommodated on request to facilitate limited investigations and referral to the Early Pregnancy Unit in their subsequent pregnancy. The clinic is led by a consultant obstetrician specialised in maternal-fetal medicine, with support of clinical midwifery specialists in bereavement and pregnancy loss. Women have the indicated medical investigations done at the time of pregnancy loss to ensure availability of the results during consultation. Investigations include a thrombophilia screen, thyroid function, autoimmune screening, and parental karyotyping. Results are routinely entered into the clinic database.

Data were collected retrospectively from the clinic database, supplemented by annual reports of perinatal deaths in 2008-2009, and by chart reviews where necessary. Women with recurrent miscarriage, mid-trimester miscarriage and stillbirth were included, while those with sporadic or non-recurrent miscarriage were excluded. Recurrent miscarriage was defined as three or more consecutive first trimester miscarriages, mid-trimester miscarriage was defined as miscarriage between 14 to 24 weeks, and stillbirth was defined as intrauterine fetal death after 24 weeks. Women with known thyroid and autoimmune disorders were excluded. Women found to have other causative factors were also excluded. Retrospective analysis was done as part of clinical audit, for which local Research Ethics Committee approval was not required.

Thyroid function tests (TFT) were performed at the time of diagnosis of pregnancy loss. Only those found to be hypothyroid (overt or subclinical) were repeated at their follow-up PLC visit. Thyroid peroxidise antibodies (TPO) were not performed in the routine investigations, and therefore not examined in this study. TFTs were analysed in the Cork University Hospital biochemistry laboratory using the Roche Modular E170 electrochemiluminescent immunoassay. Trimester specific reference ranges provided by the manufacturer were used to define hypothyroidism. Reference ranges for free T4 and TSH in the first, second and third trimester used were 12.05-19.60pmol/L and 0.33-4.59mIU/L; 9.63-17.00pmol/L and 0.35-4.10mIU/L; and 8.39-15.60pmol/L and 0.21-3.25mIU/L respectively. A study to determine trimester-specific thyroid function reference ranges in the local pregnant population was conducted concurrently, due to the lack of Irish data on thyroid function in pregnancy. Subjects from this cohort were then utilised as controls[25]. Data was analysed using PASW Statistics 18 package.

Results

Two-hundred-and-sixty-two women were included in the pregnancy loss cohort. Median maternal age was 35 years (range 18-47). One-hundred-and-twenty-eight women (128/262; 49%) had recurrent miscarriage, eighty-nine (89/262; 34%) had a late miscarriage and forty-five (45/262; 17%) had a stillbirth. In the pregnancy loss population, median TSH was 1.74mIU/L and median free T4 was 15.20pmol/L. Median free T4 and TSH in the recurrent miscarriage, late miscarriage and stillbirth groups were 15.70pmol/L and 1.60mIU/L; 14.00pmol/L and 1.69mIU/L; and 15.00pmol/L and 2.13mIU/L respectively (Table 1). Three-hundred-and-fifty-four patients were included in the control group. Median maternal age was 30 years (range 17-45). Median free T4 and TSH in the first, second, and third trimesters were 14.40pmol/L and 1.16mU/L, 12.90pmol/L and 1.16mU/L, and 11.40pmol/L and 1.59mU/L respectively[25].

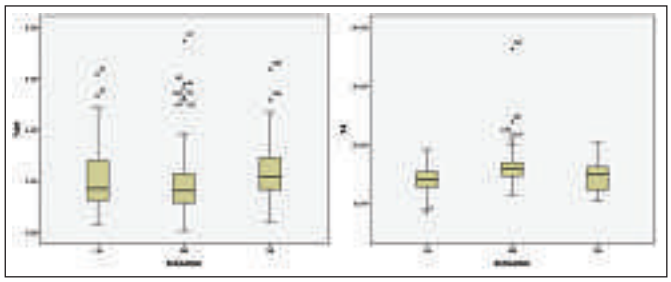
Free T4 levels in the late miscarriage group and the stillbirth group were significantly lower than those in the recurrent miscarriage group (p-value 0.001 and 0.03 respectively), likely due to the later gestation of these pregnancies. Free T4 levels between the late miscarriage group and the stillbirth group did not differ significantly. TSH levels did not differ significantly between all three groups. We compared the values of free T4 and TSH in each pregnancy loss and control groups to the trimester specific values provided by the manufacturer (Table 1). Median TSH levels in all pregnancy loss groups were higher than the assay median in each trimester. The prevalence of subclinical and undiagnosed overt hypothyroidism in the pregnancy loss population was 11.45% (30 /262), where 8.39% (22/262) were subclinical, and 3.05% (8/262) were undiagnosed overt. In the control population, 1.98% (7/354) were subclinical, and surprisingly 2.82% (10/354) were overt. The prevalence of subclinical and undiagnosed overt hypothyroidism in the pregnancy loss group

Table 1 T4 and TSH values in pregnancy loss and control groups in comparison to relevant pregnancy trimester-specific reference standards, defined as median, 2.5% and 97.5% quartiles (Reference Intervals for Children and Adults Elecys Thyroid Tests, Roche; Establishing Trimester Specific Maternal Thyroid Function Reference Intervals, Khalid et al, unpublished)

	Recurrent Miscarriage	First Trimester Control	First Trimester Reference Standard	Late Miscarriage	Second Trimester Control	Second Trimester Reference Standard	Stillbirth	Third Trimester Control	Third Trimester Reference Standard
Median T4 pmol/L	15.70	14.40	15.4	14.00	12.80	12.9	15.00	11.40	11.9
Range T4 pmol/L	11.40 – 36.30	11.62-19.24	12.05- 19.60	8.40 -19.20	10.30-16.60	9.63- 17.00	10.20- 20.20	8.30-15.59	8.39- 15.60
Median TSH mIU/L	1.60	1.08	1.48	1.69	1.60	1.52	2.13	1.59	1.42
Range TSH mIU/L	0.41- 7.46	0.11-3.25	0.33- 4.59	0.32- 6.15	0.55-3.13	0.35- 4.10	0.39- 6.35	0.55-3.91	0.21- 3.25

was significantly higher than the control group (p-value 0.0032). In the pregnancy loss group, 22.9% (60/262) had TSH levels above 2.5mIU/L, compared to 11.58% (41/354) in the control group (p-value 0.003).

According to each pregnancy loss group, subclinical or undiagnosed overt hypothyroidism were diagnosed in 7.05% (9/128) women with recurrent miscarriage, 14.61% (13/89) women with late miscarriage and 17.77% (8/45) women with stillbirth. In the control group, 4.20% (5/119) women in the first trimester (p-value 0.4148), 1.72% (2/116) women in the second trimester (p-value 0.0006), and 8.40% (10/119) women in the third trimester had low free T4 or elevated TSH (p-value 0.0983). Three of the 30 hypothyroid women also had fetal malformations; these were one case of anencephaly and two cases of cystic hygroma. When examined according to maternal age, 85.71% (19/22) of the women with subclinical hypothyroidism were overt hypothyroidism, 37.5% (3/8) were above 30 years of age.



1a 1b

Figure 1a Box plots demonstrating the distribution of TSH levels according to pregnancy loss groups.

Figure 1b Box plots showing the distribution of free T4 according to pregnancy loss groups.

Discussion

In this study, the prevalence of subclinical and undiagnosed overt hypothyroidism in the pregnancy loss cohort was 11%, of which 8% were subclinical. In the general pregnant population, the prevalence of overt and subclinical hypothyroidism is reported as 0.3-0.5%, and 2-3% respectively[1]. Our study demonstrates a higher prevalence of subclinical hypothyroidism in a large observational cohort of women with pregnancy loss. These findings support the association of overt and subclinical hypothyroidism with pregnancy loss. A previous study demonstrated that in untreated hypothyroid women, 60% of the overtly hypothyroid women and 71% of the subclinically hypothyroid women had miscarriage[2]. In adequately treated women, the risk was minimal[2,8]. In our study, 7% of women with recurrent miscarriage were either overtly or subclinically hypothyroid. Another study has demonstrated the prevalence of hypothyroidism to be 4.12% in women with recurrent miscarriage. However there, only overt hypothyroidism was examined[3]. Another report showed that 3.8% of women with first trimester miscarriages had subclinical hypothyroidism. In contrast to our study, these authors included women with sporadic miscarriage[6].

Interestingly, our study has also shown a higher prevalence of hypothyroidism in women with late miscarriage (14%) and stillbirth (17%) compared to other reports, where 10% of women with late miscarriage, and 6% of women with stillbirths were hypothyroid[10].

The risk of fetal death with increasing levels of TSH has been reported[5]. Most recently, an increased incidence of pregnancy loss in women with TSH between 2.5-5.0 mIU/L in the first trimester was demonstrated, calling for redefining the upper limits of TSH in the first trimester of pregnancy[4]. Our study showed that 23% of women with pregnancy loss had TSH levels above 2.5mIU/L, supporting the evidence that increased TSH alone can be associated with pregnancy loss. We were unable to examine the prevalence of thyroid autoimmunity in this population, as this test was not routinely available at the time of the study. These findings support the debate on the benefits of screening and subsequent treatment of abnormal thyroid function in pregnancy. Universal screening has never been clinically justified due to the lack of evidence supporting treatment of subclinical hypothyroidism, and the lack of quality studies demonstrating its cost-effectiveness[19,20]. Targeted screening of women at risk is advocated instead[1,12,19,21]. However, this can potentially miss 30% of those with thyroid disorders[21]. Universal screening can detect twice as many women with thyroid disorders in early pregnancy compared to targeted screening[21-23], but whether treatment should then be initiated for all is unclear. Finally, as hypothyroidism in very early pregnancy affects pregnancy outcome, some authors argue that screening should take place pre-conceptually. However, subsequent intervention remains controversial.

In conclusion, this study has demonstrated a significant prevalence of undiagnosed overt and subclinical hypothyroidism in women with pregnancy loss, supporting the association between pregnancy loss and hypothyroidism. Future research is needed to define optimal thyroid function levels in pregnancy, to justify the most appropriate approach and timing of screening, and to evaluate the efficacy, safety, and the magnitude of benefit from intervention.

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Factors Affecting Receipt of a Medical Card in a Cohort of Colorectal Cancer Patients, 2002-2006

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Abstract
The criteria for allocation of medical cards to colorectal cancer patients <70 were explored. All invasive colorectal cancers diagnosed during 2002-2006 (n=4,762) were abstracted and linked to the PCRS master file to determine medical card status. Determinants of medical card possession before diagnosis were; age 65-69yr vs. 15-54yr (OR=3.95(95%CI);3.20-4.88), other status vs. married (OR=1.89;1.61-2.23), most vs. least deprived (OR=3.65;2.89-4.61), smoker vs. non-smoker (OR=1.98;1.64-2.37), ED population density (<1/ha vs.>15/ha; OR=1.47;1.20-1.80). Determinants of medical card possession after diagnosis were; age 65-69yr vs. 15-54yr (OR=0.77;0.62-0.96), most vs. least deprived (OR=2.15;1.72-2.70), stage IV vs. I: OR=2.49;1.85-3.36), chemotherapy (OR=2.30;1.87-2.83), radiotherapy (OR=1.40;1.13-1.72), ED population density (<1/ha vs.>15/ha; OR=1.47;1.19-1.82), HSE South vs. DNML (OR=1.76;1.40-2.21). Medical card possession among colorectal cancer patients was determined by greater age and deprivation before diagnosis; and younger age, greater deprivation, advanced stage and treatments warranted by extent of disease after diagnosis. Low population density of ED of residence also predicted card receipt.

Introduction

A cancer diagnosis can have significant financial implications for individuals and their families. Direct costs may include costs of appointments with health professionals, hospitalisation, tests, procedures and treatment[1-3] and out-of-pocket expenses.[4-7] In Ireland, 45% of cancer patients had paid to see a consultant or other hospital clinician, and 36% had paid to see a GP about their cancer.[8] The average amounts spent were €465 for consultant fees and €250 for GP fees. In addition, almost 30% of patients had had out-of-pocket expenses for supportive medications.[8] Approximately 30% of the population held a medical card in 2007.[9] Eligibility is means tested in those less than 70 years and, from the middle of 2001 until the beginning of 2009, entitlement was universal on attaining 70th birthday. The level of medical card coverage for this age group rose from 79% in 2001 to 95% in 2007.[9] Cancer patients who were not already in possession of a medical card at the time of diagnosis could apply for one on hardship grounds following diagnosis.[10] The awarding of a card

to those who apply is administered through community welfare officers and the system is discretionary. In general little is known about patterns of medical card possession among cancer patients in Ireland, or about which factors determine receipt after diagnosis. We identified factors associated with possession of a medical card before diagnosis in a population-based series aged under 70 years with colorectal cancer, the second most commonly diagnosed cancer in Ireland.[11] We also – for the first time in Ireland – identified factors associated with receipt of a medical card after date of diagnosis in those cases who did not have one before diagnosis.

Methods

Cases were abstracted from the National Cancer Registry (NCR) on all invasive colorectal cancers (ICD-02, C18 'colon' and C19-20 'rectum') diagnosed between 01/01/2002-31/12/2006 (figure 1). The NCR records all cancers diagnosed in the population usually resident in Ireland. Completeness of registration is estimated to be approximately 97%.[12] Information was abstracted on patient characteristics (e.g. date of birth, gender), clinical details (e.g. date of incidence, stage at diagnosis, tumour site). Using T,N,M data, cases were assigned an AJCC summary stage (I-IV)[13]; cases where information on distant metastasis was not recorded were assumed to be localised tumours. As a proxy for income, quintiles of deprivation were derived for cases by linking the address of the case at diagnosis to an electoral division (ED).[14] Cases were categorised by population density of their ED of residence based on census data for 2002.[19]

Table 1 Colorectal cancer in Ireland: 2002-2006. Factors associated with receipt of a medical card before and after date of diagnosis: Percentages who received a card, odds ratios (OR) and 95% confidence intervals (95% CI)

		Held card before diagnosis 1,547 /4,762 (32%)					Received card after diagnosis 1,435 /3,215 (45%)				
Factor	**Category**	**Card%**	**OR^**	**[95%CI]**		**p**	**Card%**	**OR^**	**[95%CI]**		**p**
Age	15-54	21%	1				48%	1			
	55-64	31%	1.88	[1.54,	2.29]	***	47%	1.10	[0.91,	1.32]	
	65-69	46%	3.95	[3.20,	4.88]	***	37%	0.77	[0.62,	0.96]	*
Sex	Female	33%	1				44%	1			
	Male	32%	0.81	[0.69,	0.95]	*	45%	0.97	[0.82,	1.15]	
Deprivation quintiles	1 least	17%	1				33%	1			
	2	25%	1.52	[1.15,	2.01]	*	45%	1.46	[1.14,	1.87]	*
	3	32%	1.95	[1.46,	2.59]	***	47%	1.56	[1.19,	2.03]	*
	4	35%	2.20	[1.69,	2.86]	***	49%	1.60	[1.24,	2.06]	**
	5 Most	47%	3.65	[2.89,	4.61]	***	52%	2.15	[1.72,	2.70]	***
Smoking status	non smoker	29%	1								
	ex-smoker	35%	1.28	[1.05,	1.55]	*					
	smoker	44%	1.98	[1.64,	2.37]	***					
Marital Status	Married	27%	1								
	Other†	45%	1.89	[1.61,	2.23]	***					
Population density‡ of ED	>15 /hectare	30%	1				38%	1			
	1-15 /hectare	29%	0.94	[0.76,	1.17]		45%	1.25	[1.01,	1.55]	*
	<1 /hectare	38%	1.47	[1.20,	1.80]	**	50%	1.47	[1.19,	1.82]	**
HSE area of residence	DNML	26%	1				38%	1			
	DNNE	29%	0.99	[0.77,	1.26]		38%	0.97	[0.77,	1.22]	
	South	35%	1.27	[1.02,	1.57]	*	57%	1.76	[1.40,	2.21]	***
	West	41%	1.45	[1.15,	1.82]	*	46%	1.18	[0.92,	1.51]	
Stage of disease	stage I						25%	1			
	stage II						42%	1.51	[1.13,	2.01]	*
	stage III						52%	1.70	[1.26,	2.29]	**
	stage IV						57%	2.49	[1.85,	3.36]	***
Chemotherapy	no						27%	1			
	yes						54%	2.30	[1.87,	2.83]	***

‡ Census population density of ED for 2002[19]
*p<0.05, **p<0.001, ***p<0.0001 (Wald test)
† Single, divorced, separated and widowed
ORs >1.0 indicate increased likelihood of holding or receiving a medical card
^ORs were mutually adjusted for each of the other variables in the model

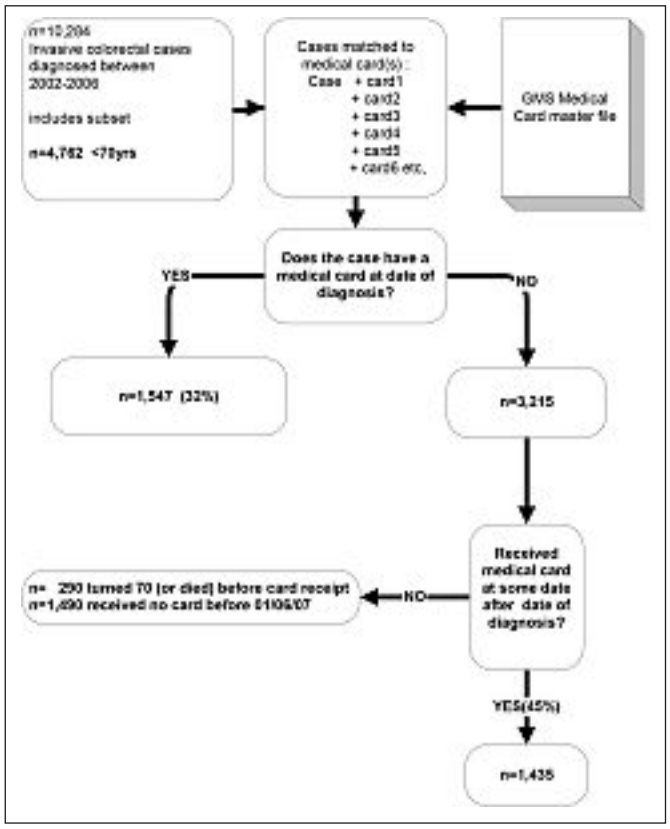

Figure 1 Colorectal cancer in Ireland: 2002-2006. Study flow and cases.

HSE area of residence (Dublin Mid Leinster (DNML), Dublin North East (DNNE), South, West) was derived from address. Cases were categorised according to treatment received (surgery, chemotherapy and/or radiotherapy).

Cases were linked to the medical card master file maintained by the PCRS, which included details of all medical cards in circulation between 01/01/2000 to 31/05/2007. All cards associated with each colorectal cancer case were identified. Each card had an issue date and an expiry date. A person was deemed to have had a medical card at the time of diagnosis if the date of diagnosis of the cancer occurred between the issue and expiry dates of any card(s) registered to a case. Cases greater than 70 years old at date of diagnosis were excluded. 3,215 cases who did not have a medical card at diagnosis were followed from the date of diagnosis until date of receipt of a medical card up until 01/06/07 (one day after the date of last card issued) (figure 1).Factors associated with possession of a medical card at the time of diagnosis, and after diagnosis were investigated using stepwise logistic regression. Variables were included in the models if they were significant in likelihood ratio tests (at p<0.10), with care taken to avoid multicollinearity.

Results

During 2002-2006, 10,284 new cases of invasive colorectal cancer were diagnosed in Ireland; 4,762 were aged <70 years, 32% of whom (1,547) held a medical card at diagnosis (Figure 1).

Medical card possession at time of diagnosis

In multivariate analyses (Table 1), medical card possession at

diagnosis increased with age, from 21% in those under 55 years to 46% in those aged 65-69 yrs (OR=3.95; 95%CI;3.20-4.88), Males cases were marginally less likely to hold a medical card (OR=0.81;0.69-0.95). Unmarried cases held more medical cards than married cases; 45% vs. 27% respectively (OR=1.89;1.61-2.23). Almost half (47%) of those resident in the most deprived areas held a medical card compared to 17% of those in the least deprived areas (OR=3.65;2.89-4.61). 44% of smokers held a card relative to 29% of non-smokers (OR=1.98;1.64-2.37). 38% of cases resident in ED's with low population density (<1/ha) held medical cards compared to 30% of cases resident in higher density EDs (>15/ha) (OR=1.47;1.20-1.80). HSE West (41%) and HSE South (35%) showed higher card possession compared to DNML (26%) (OR=1.45;1.15-1.82 and OR=1.27;1.02-1.57 respectively).

Medical card receipt after diagnosis

Of the remaining 3,215 cases who did not have a card at diagnosis 1,435(45%) subsequently obtained a medical card before their 70th birthday at various times after diagnosis (figure 1); 53% received it within 3 months of diagnosis, 74% within 6 months, 82% within 9 months and 90% within 18 months of diagnosis (Figure 2). In multivariate analyses (Table 1), older persons (65-69yrs) were less likely to receive a medical card relative to younger persons (15-54yrs) (OR=0.77;0.62-0.96). 52% of those resident in the most deprived areas held a medical card compared to 33% of those in the least deprived areas (OR=2.15;1.72-2.70). 57% of cases with stage IV disease received a medical card compared to only 25% of cases with stage I (OR=2.49;1.85-3.36). Cases who received chemotherapy (OR=2.30;1.87-2.83) or radiotherapy (OR=1.40;1.13-1.72) were significantly more likely to obtain a card post-diagnosis. Cases resident in low population density EDs (<1/ha) were more likely to receive a card relative to cases from high population density EDs (OR=1.47;1.19-1.82). Cases resident in HSE South (57%) were more likely to receive a medical card compared to cases from DNML (38%) (OR=1.76;1.40-2.21).

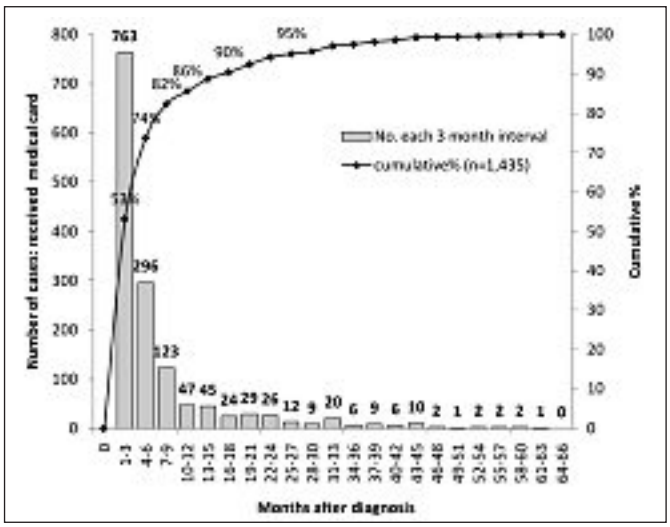

Figure 2 Colorectal cancer in Ireland: 2002-2006. Time of receipt of medical cards in 1,435 cases who obtained a medical card after diagnosis

Discussion

Two-thirds of all those with colorectal cancer held a medical card at the time of diagnosis, which was twice as high as the figure for the general population (30%).[9] This was probably due to the age structure of the population; the median age at diagnosis was 71 years. Among those <70 yrs, 32% held a medical card, which was in line with that of the general population for the same period.[9] Similarly, card possession among those 70 and older (89%) was consistent with the general population (79-95% between 2001-2007).[9] Income threshold is the prime determinant of who receives a medical card. Our aim was to identify other factors that influenced who held a medical card, and who got one after diagnosis. In the absence of income information we derived ED based quintiles of deprivation as a proxy for income.[14] There were 3,215 cases who did not have a card at diagnosis, 1,435 (45%) of whom subsequently obtained a medical card after diagnosis. This figure was similar to that reported from a survey of individuals with breast, prostate and lung cancer.[8] In the <70 years subset, we found that a colorectal cancer case was more likely to hold a medical card at diagnosis if they were; female; unmarried; a smoker; aged 65-69 years; from a sparsely populated and deprived area within the west or south of the country. In contrast, after diagnosis, a case was more likely to receive a medical card if they were; <55 years; with stage III/IV tumour; required chemotherapy and/or radiotherapy; and lived in a more deprived and sparsely populated area within the south of the country.

A systematic review showed that residence in rural areas, lower educational attainment, and tumour in rectum were linked with delayed presentation in colorectal cancer.[16] Delayed presentation with tumour in the rectum was observed in cases with lower socio-economic status (SES) and single status in Denmark.[17] Similarly, lower SES was a predictor of delayed presentation in colorectal cancer in the US.[18] These types of associations may explain the observed relationships between deprivation, stage and medical card possession after diagnosis. The fact that married persons were less likely to have a card at diagnosis was probably because the couple had means in excess of the threshold for a medical card. Smokers are over represented in the lower SES groups which explains why they were more likely to hold a medical card at time of diagnosis.[15] Unemployment is associated with male colorectal cancer in Ireland with a steady increase in risk as the unemployment levels in an ED increased.[19] This dataset is in keeping with that finding; males were marginally over represented in the most deprived quintiles; 33% males and 30% females. There is a strong perception among both oncology social workers and cancer patients that there is geographical variation in the ease with which medical cards are obtained in individuals after diagnosis with cancer.[8] This study provides evidence that such variation does exist. Why those residing in HSE South should have higher levels of medical card receipt after diagnosis is unclear, especially as the model adjusted for factors such as age, stage, population density and deprivation. The HSE areas which had higher levels of card possession at diagnosis also had a higher level of card receipt post-diagnosis, which suggests that some administrative, rather than individual-level, factors must explain the associations.

This study was not able to take into account personal income and some other potentially important determinants (i.e. co-morbidities, and case mix) which could explain differences between the HSE Eastern and HSE South/West regions. Application for a medical card is made in writing to the HSE using form MC1.[8] Question E, part 4 of form MC1, is concerned with 'exceptional circumstances leading to financial hardship', such as 'travel, accommodation and childcare costs related to attending clinics or hospitals'. Previous research has shown that cancer patients may have considerable out-of-pocket expenses associated with attending treatment appointments.[4-7] We have shown that the persons from more sparsely populated areas tended to satisfy the criteria for a medical card and that this partially accounts for the greater card possession in HSE South/West when compared with the HSE Eastern areas. Because the system for obtaining a medical card on hardship grounds after the diagnosis of cancer is discretionary, and the decision on whether to award a card ultimately lies with the local community welfare officer, it is perhaps inevitable that there are unexplained variations in the distribution of cards.

These findings show that medical card possession before diagnosis of colorectal cancer is determined by deprivation status, and greater age. After diagnosis, cards are allocated to younger cases based on deprivation and treatments warranted by more extensive disease. Population density and HSE area of residence was also predictive of who received a medical card. Whatever the

reasons for this, we have highlighted unequivocally that regional differences in medical card possession with colorectal cancer do exist.

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Acknowledgements
P Burke for access to the medical card master file held by the PCRS. The tumour registration officers and other staff of the NCR involved in the collection and processing of the data on which this study is based. This study was conducted under the auspices of a grant from the Health Research Board.

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General Practitioners' Perspectives on Revised Entry and Selection Methods to Medicine and the HPAT

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Abstract
Revised selection mechanisms to medicine now include an adjunct admission test known as the HPAT. Stakeholder acceptability is a key issue. General Practitioners (GPs) represent an important stakeholder group. A questionnaire was administered to a regional sample of GPs evaluating their knowledge of the new selection system, views on acceptability, performance on sample HPAT questions and perceptions of their relevance. 92 respondents (75.4%) reported they had little or no knowledge of the HPAT. GPs supported the use of aptitude tests (85 respondents 69.7%). However almost one third (39 respondents, 32%) either disagreed or strongly disagreed with the reforms introduced. The majority strongly supported the Leaving Certificate as a selection tool (118 respondents, 96.7%). GPs performed well in the sample questions. Items from Section 2, measuring interpersonal understanding, were judged to be the most relevant.

Introduction
The introduction in Ireland of a revised process to determine admission to medical school has been contentious.[1,2] Reforms in 2009 included the introduction of the HPAT (Health Professions Admission Test) coupled with an adjustment of the weighting applied to the Leaving Certificate and a moderation of the calculation of Leaving Certificate points.[3] The HPAT is a 2½ hour multiple choice paper. It comprises three sections; 1. Logical Reasoning and Problem Solving; 2. Interpersonal Understanding and 3. Non-Verbal Reasoning[4]. It belongs to a family of selection tools that test general mental ability. Other similar such tests include the UMAT, used in Australia and the UKCAT which was introduced to Great Britain in 2006[5,6]. Research in the area of entry and selection to medical school is growing internationally. There is an increasing acceptance that the more traditional approaches to selection such as sole reliance on academic achievement or traditional interview are of themselves insufficient to select tomorrow's doctors[7]. Much of the research on tests similar to HPAT examines the test predictive validity. Overall, the findings are mixed in terms of whether such tests predict subsequent medical school performance or enhance the selection process[8,9].

It is important however that specialised admission tests are acceptable to stakeholders and that the assessment items therein appear relevant i.e. achieve face validity. To date this important question has received less attention. Previously the performances of Consultant Surgeons, NCHDs and Medical Students in a modified HPAT were analysed[10]. In this study no results of statistical significance were returned, however the performance of consultant surgeons was only minimally better than undergraduate medical students. This caused the authors to question the acceptability of the test. In a separate study the Leaving Certificate and a modified HPAT were both found to be predictive of college exam performance; however they were not correlated with each other leading the authors to conclude that were assessing different applicant attributes[11]. General Practitioners are an important and influential stakeholder group representing the career pathway chosen by approximately 50% of all future medical school entrants. We were keen to ascertain the level of knowledge amongst GPs regarding the new system for admission into medicine; establish their views on its acceptability; determine their performance in sample questions and evaluate their perception of the relevance of test items used.

Methods

This was a quantitative observational study, using a 27 item questionnaire and three sample HPAT questions. Section 1 determined demographics; Section 2 assessed knowledge of the HPAT and the revised selection criteria; Section 3 established GPs' views on acceptability of the HPAT, the Leaving Certificate and other tools for the selection of medical students and, Section 4 comprised three sample HPAT questions which the GPs answered and subsequently rated on a four point likert scale in terms of relevance to medical practice. Questionnaires were posted, with a participant information letter and consent form, to a convenience sample of 143 GPs from the Cork Registry (ICGP Directory) and to the 12 GP trainees of the Cork Specialist Training Programme in General Practice, in year two at the time of the questionnaire (September 2010). Telephone reminders to non responders were conducted one week later. Ethical approval was obtained from the Research Ethics Committee of the Cork Teaching Hospitals (CREC). All data was entered and analysed using SPSS 17.0 for Windows (SPSS, Inc., Chicago, IL, USA).

Table 1 GPs' opinions on the appropriateness of a variety of tools used for selection to medicine

Appropriateness of selection tool	Aptitude test	Leaving Cert	Interview	Personal Statement	Knowledge of the Course	Personality traits
1-strongly agree	n=17 (13.9%)	n=51 (41.8%)	n=20 (16.4%)	n=6 (4.9%)	n=11 (9%)	n=19 (15.6%)
2	n=68 (55.7%)	n=67 (54.9%)	n=47 (38.5%)	n=19 (15.6%)	n=39 (32%)	n=44 (36.1%)
3	n=19 (15.6%)	n=1 (0.8%)	n=19 (15.6%)	n=21 (17.2%)	n=18 (14.8%)	n=28 (23%)
4	n=6 (4.9%)	n=1 (0.8%)	n=13 (10.7)	n=35 (28.7%)	n=24 (19.7%)	n=15 (12.3%)
5-strongly disagree	n=6 (4.9%)	n=0 (0%)	n=17 (13.9%)	n=29 (23.8%)	n=21 (17.2%)	n=10 (8.2%)
Non responders	n=6 (4.9%)	n=2 (1.6%)	n=6 (4.9%)	n=12 (9.8%)	n=9 (7.4%)	n=6 (4.9%)

Results

Demographics

A response rate of122 (79%) was achieved comprising 114 GPs and 8 GP trainees of which there were 67 males and 54 females (one respondent did not complete this section). Ages ranged from 30 to 69 years. The majority of respondents were aged between 30-49years.

Knowledge of HPAT

Respondents were asked to rate their own knowledge of the HPAT on a seven point likert scale. The majority 92 respondents, (75.4%) reported they had little or no knowledge of the HPAT while only 4 respondents, (3.3%) felt they had good knowledge. GPs seemed unaware of who designs the HPAT paper annually (40 respondents, 33%). The majority, 96 respondents, (78.7%), also seemed unsure of how entry points were calculated based on combined HPAT and Leaving Certificate scores.

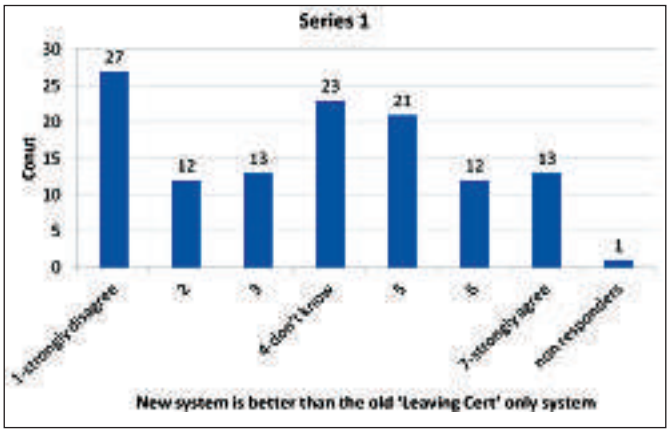

Figure 1

Views on acceptability of HPAT and other selection tools

These are summarised in table 1. A majority n=85 or (69.7%) indicated that aptitude testing is an appropriate tool for determining entry to medicine. Almost all respondents believe that the Leaving Certificate is an appropriate selection tool (118 respondents,96.7%). Other selection mechanisms were also considered appropriate, such as interviews (67 respondents, (54.9%)) and personality traits (63 respondents, (51.6%)). A significant number of respondents either disagreed or strongly disagreed with using personal statements (64 respondents, 52.5%)) and knowledge of the course; (45 respondents, 36.9%) in the selection process. However when asked to directly compare old versus new entry and selection mechanisms (i.e. if the newer selection criteria were more effective than the Leaving Certificate alone in identifying the most appropriate candidates to enter medical school), almost one third either disagreed or strongly disagreed (39 respondents, 32%), while only 25 agreed or strongly agreed (20.5%). This is further illustrated in Figure 1.

Respondents appear to acknowledge that socioeconomic factors can affect test outcomes but that the Leaving Certificate may be marginally more influenced by this variable than the HPAT. When we asked separately if performance in each were affected by socioeconomic status; 87, (71.3%) agreed on some level that it did affect the Leaving Certificate performance, while 80, (65.6%) were of the opinion that it affected HPAT performance.

Sample HPAT questions

Table 1 captures the pattern of correct responses to sample HPAT questions, one from each of the three Sections of a HPAT-Ireland practice test booklet and the estimation of question relevance to future medical practice, (section 2 was a two part question). While 69 respondents (56.6%) identified the correct answer to question 1, from Section 1(Logical Reasoning and Problem Solving), the majority felt it was irrelevant as a question type in determining suitability to practice medicine. Respondents were more successful in the second sample question representing Section 2 (Interpersonal Understanding), with 103 (84.4%) respondents identifying the correct answer in part one, and 81 respondents (66.4%) in part two, and more positive feedback regarding the relevance of such a question. The results of the third sample question representing Section 3 (Non-Verbal Reasoning) were similar to the trends observed in section

Table 2 Proportion of correct answers to sample HPAT questions and GP opinions on relevance of each question type

HPAT Section	Correct responses	Irrelevant	Somewhat Relevant	Very Relevant	Don't know	Non responders
Sample question Section 1	n=69 (56.6%)	n=51 (41.8%)	n=43 (35.2%)	n=7 (5.7%)	n=15 (12.3%)	n=6 (4.9%)
Sample question section 2	(1)n=103 (84.4%) (2)n=81 (66.4%)	n=23 (18.9%)	n=56 (45.9%)	n=29 (23.8%)	n=6 (4.9%)	n=8 (6.6%)
Sample question Section 3	n=84 (68.9%)	n=53 (43.4%)	n=47 (38.5%)	n=5 (4.1%)	n=13 (10.7%)	n=4 (3.3%)

one with 84 (68.9%) respondents identifying the correct answer and a majority questioning its relevance.

Discussion

The strength of this work is that it evaluates the knowledge and opinion of the new entry and selection mechanisms of a sample of regional GPs. A high response rate was achieved reflecting the keen level of interest in this selection process. There is no reason to think that these responses do not reflect those of GPs elsewhere. There are however also obvious limitations to this study; the sample size was relatively small and represents a convenience sample. Respondents answered only three HPAT test questions, hence, findings cannot be generalised to the entire HPAT paper. The study design was quantitative which limits the depth of data that our questionnaire was able to elicit from our participants. Therefore results need to be interpreted with caution.

The GPs in this survey report a knowledge gap with respect to the HPAT and the detail of the revised selection criteria. Over half of all the GPs stated that they had no knowledge of the HPAT and over three quarters were unsure of how entry points were calculated according to the HPAT / Leaving Certificate combined system. This is to be expected as the reforms are recent and there was limited occasion for consultation within the medical profession before their introduction. However, as the attrition rate in medical school is low, the selection process effectively determines who will become the doctors of tomorrow[12]. Therefore it is desirable that all medical professionals have adequate opportunity to be well informed regarding the selection tests used. GPs appear relatively divided as regards the merits of the revised approach to entry and selection to medicine. While over one fifth strongly disagree with the revised mechanisms it would seem that there also was some dissatisfaction with the previous system as only one tenth strongly prefer the older approach. This would suggest that many are relatively undecided or open minded and may be influenced by emerging evidence or perhaps personal experience.

GPs appear to embrace the use of selection tools other than knowledge-based tests such as the Leaving Certificate and many seemed to be in favour of the use of interviews and personality trait testing. The support for interviews may be influenced by recent innovations in that format or experience with these at post graduate level however the acceptability of personality trait testing is less validated.[13,14] Although clearly the Leaving Certificate system is still endorsed as the most appropriate metric, a significant number of respondents were amenable to the use of aptitude tests. This prompts the consideration that discontent with the new system may not necessarily be related to the use of HPAT or similar tests per se, but rather the actual content of the test and the mechanism by which their use is implemented. Other unidentified issues may be at play. Many GPs correctly identify the degree to which socioeconomic status can affect scores in school exit examinations like the Leaving Certificate and this is a cause of concern elsewhere[15]. They express concerns however that the HPAT may also favour the socioeconomically advantaged. Equity of access is a key issue in entry and selection and potential socioeconomic advantages associated with tests must be carefully evaluated. The majority of GP respondents identify correct responses to HPAT sample test material however question the relevance of some of the items. Although HPAT sample questions cannot be representative of the entire test material, it is interesting that Section 2 which sets out to measure interpersonal understanding currently achieves most acceptability amongst general practitioners. Perhaps expansion of the representation of this type of test material would lead to greater acceptability of tests like HPAT.

In conclusion, medical school entry and selection will undoubtedly continue to generate debate. This is appropriate as the outcomes affect all. Our study suggests that although support for traditional knowledge based tests is strong, additional admission tests which measure non cognitive domains, especially those related to interpersonal skills, are also acceptable to stakeholders.

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Patient Knowledge of Peripheral Vascular Disease in an Outpatient Setting: An Achilles Heel?

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Abstract
Peripheral vascular disease (PVD) has numerous modifiable risk factors. This study aimed to establish patients' awareness of risk factors and causes of PVD and their understanding of mechanisms of secondary prevention. A prospective survey of awareness of PVD among patients attending a tertiary vascular clinic for management of peripheral vascular disease was undertaken. Institutional review board approval was granted. Statistical analysis was performed using SPSS version 18.0 software. There was a 100% response rate, with 97 participants (53 male). Seventeen patients (19%) reported an interval of greater than six months from the onset of symptoms to first seeking medical attention with their General Practitioner. Only 19 (20%) could correctly identify 3 or more risk factors for peripheral vascular disease. Patients have limited awareness of PVD and its consequences. Educational initiatives are needed to encourage patients to seek early medical attention and raise awareness of modifiable risk factors in the community.

Introduction

Peripheral Vascular Disease (PVD) is a common condition, affecting up to 29% of the elderly population,[1-3] and is a major cause of impaired quality of life and mortality[4-6]. If untreated, PVD may lead to progressive disability and major amputations in up to 12%[7]. Moreover, it is associated with significant mortality, largely due to the high incidence of concomitent coronary and cerebrovascular disease[8-10]. As there are many modifiable risk factors for PVD, including smoking, diabetes and dyslipidaemia[11], early diagnosis and secondary prevention is imperative not only to reduce complications from PVD itself, but also to identify "arteriopaths", who are at higher risk of other ischaemic events such as heart disease and stroke[12].

Despite its prevalence, PVD remains relatively poorly publicised compared to other diseases[10]. A number of population based studies have shown a low level of awareness and knowledge of peripheral vascular disease among the population.[10,13-17] Indeed, knowledge is poor among those both at low and high risk[10,15,17,18]. Previous studies have examined population based initiatives to screen patients at risk of PVD and to increase their awareness of PVD[3,19]. One such initiative, "Legs for Life" found that educational strategies were effective 6 months following intervention[20], although whether these initiatives lead to improved long term health outcomes remains to be seen. PVD is highly prevalent in the primary care setting, but may be under-recognised compared to other vascular diseases[1]. Similarly, studies have shown poorer knowledge of risk factor reduction and optimal targets in PVD among healthcare professionals[1,21,22]. Early diagnosis and treatment is recognised to improve outcomes in peripheral vascular disease[12], and with its emphasis on primary and secondary prevention, primary care is an ideal setting for this. The primary objective of this study was to assess patients' understanding of peripheral vascular disease and strategies for secondary prevention. Secondary objectives included assessing patient's health seeking behaviours and the role of primary care in secondary prevention.

Methods

A paper-based questionnaire was completed by patients attending a vascular outpatient clinic with known or suspected peripheral vascular disease at a university teaching hospital. No commercially available survey met the needs of the present study. Therefore, a survey was designed de novo, with reference to the current literature (available on request). The study was approved by the Research Ethics Committee at St. Vincent's University Hospital. The survey consisted of four components; Background demographical information, Disease severity, Patients' knowledge of PVD and Health improvement strategies. Patients who refused consent or were unable to give informed consent to participate due to language difficulties, sensory impairment or medical problems were excluded. Data collection was performed by a medical practitioner (MO), who distributed the paper survey to patients with known or suspected PVD at the vascular outpatient clinic for the first time or for review appointments. Statistical analysis was performed using SPSS PASW 18.0 statistical software. Chi squared test and Mann-Whitney U test were used.

Results

The response rate was 100% (n=97).

Demographic Data

There were 53 male and 44 female patients. The majority of patients were over 45 years old. Almost half the patients had completed primary school education (Table 1). 49 (51%) of participating patients were first-attenders at the vascular outpatients, while the remainder were return patients.

Disease Severity

Symptoms of PVD are shown in Table 2. 64 (66%) patients reported that their symptoms were interfering with their quality of life. Thirteen patients had previously undergone surgery for lower limb PVD. The median time since diagnosis of PVD was six months (range 0-336 months). Seventeen (17.5%) patients had waited over six months before first seeking medical attention from their general practitioner. There was no statistically significant difference by age, gender or education in the length of time patients waited before seeking medical attention. 66 patients were smokers when they developed symptoms of peripheral vascular disease. Over one–third of patients still smoked. There was a significant difference in lifestyle limitation due to PVD among those who were currently smoking (n=34) versus non-smokers (n=31) (p=0.04). However, there was no statistically significant difference in claudication distance between smokers and non-smokers. 66 patients reported taking an anti-platelet agent (55 aspirin alone, one clopidogrel alone, ten clopidogrel and aspirin). 32 patients were commenced on anti-platelet therapy by their general practitioner (GP), twelve by a vascular surgeon, seven by cardiology and four by the diabetic clinic.

Understanding of peripheral vascular disease

Only 25 (26%) correctly identified the arterial tree as the affected system in PVD. There was no significant correlation

Table 1 Patient Characteristics

AGE GROUP	N (% respondents)
18-34	3 (3)
35-54	4 (4)
45-54	7 (7.1)
55-64	25 (26.3)
65-74	36 (37.4)
75+	22 (22.2)
GENDER	Male 53(55)
	Female 44(45)
LEVEL OF EDUCATION	
Primary School	44(46)
Some secondary school	17(18)
Completed Secondary School	18(19)
Trade	7(7)
University	10(10)
FIRST VASCULAR OPD SMOKING STATUS	
Currently smoking	34(35)
Smoking within 10 years	66(68)
Smoked > 10 years ago	20(21)
Never Smoked	11(11)
CO-MORBIDITIES	
Cardiac	21
Renal	3
Diabetes	18

Table 2 Presentation and Functional Status	N
CLAUDICATION DISTANCE	
>100m	29
30-100m	44
<30m	18
SYMPTOMS	
Calf pain when walking	10
Pain at rest	2
Ulceration	13
Burning pain	11
Other	6
DURATION BEFORE ATTENDING GP	
0-3months	57
3-6months	13
6-12months	8
>1 year	9
ABI (median; range)	
Right	0.89; range 0.44-1.18
Left	0.82; range 0.38-1.00

Table 3 Strategies for Symptom Improvement	N
Smoking Cessation	24
Exercise	35
Diet	10
Medications	4
Surgery	2
Combination of the Above	16
Don't Know	27
Other	11

between age, gender or educational level and correct identification of the arterial system.

Modifiable Risk Factors
Smoking
Overall 61 (62.9%) patients were aware that smoking was a risk factor for PVD. A much larger proportion of return patients than first visit patients agreed that smoking was a risk factor for PVD (47.1% versus 79.2% p=0.001). 27 (28%) gave up smoking when they developed symptoms. 22 (23%) did not believe their smoking and their PVD symptoms were related.

Hypertension, Diabetes and Hypercholesterolaemia
Only 21 (21.6%) patients overall were aware that diabetes mellitus is a risk factor for PVD. 25 (26%) patients were aware that hypertension is a PVD risk factor and 29 (30%) patients identified a link between hypercholesterolaemia and PVD. There was no significant difference in awareness of any of these risk factors based on first and return visits, age, gender or educational background.

Non-modifiable Risk Factors
Age
21 (21.7%) of patients were aware that age was a risk factor for PVD.

Non-risk factors
Six patients felt that wet clothes were risk factors for PVD. None of these patients had completed secondary level education or higher (p=0.002). 3 (3%) patients felt that hot water was a risk factor for PVD.

Health Improvement Strategies
Patients were asked to list which strategies they felt would improve symptoms. While smoking cessation was the most commonly cited strategy, it was in fact only listed by 23 (24%) patients (Table 3).

Exercise
Exercise was correctly identified as an important strategy to improve symptoms (p=0.448) (Table 3). 53 patients (54.6%) reported taking regular exercise; 66.7% men versus 43.2% of women (p=0.02). Even when corrected for age there was a significant correlation between gender and exercise, with men exercising more than women (Pearson correlation coefficient 0.217, p=0.33). Median duration of exercise was 30 minutes (range 0-540 minutes). This was not influenced by previous attendance at the vascular clinic, age, smoking status, lifestyle limitation, education or claudication distance. Exercise was undertaken on average seven times per week (range 0-14). 52 patients (53.6%) had been advised by their GP to undertake regular exercise. 36 had been given specific information on how to approach an exercise programme. However, there was no correlation between advice from the GP and whether or not a patient undertook regular exercise.

Risk of other vascular disease
Overall 57 (58.8%) were aware that PVD was associated with an increased risk of myocardial infarct or stroke. Those patients who were aware of the association between PVD and risk of myocardial infarct reported a longer duration of symptoms.

Interaction with Primary Care
90 (93.8%) patients recalled having their blood pressure checked by their general practitioners, while fewer patients reported having blood tests with their GP for glucose (n=46) and cholesterol (n=64).

Sources of Information
The GP was the most likely to introduce the diagnosis of PVD to patients. Only 7 patients reported looking for further information on PVD from other sources, and only one patient had utilised the internet to educate themselves further about PVD.

Discussion

This study emphasises that primary care represents an important gateway for secondary prevention in symptomatic peripheral vascular disease. Patients with PVD represent an often disadvantaged cohort, with poorer educational and social background[18]. In our study, the level of education correlated strongly with aspects such as the length of time to diagnosis. Compared to other patient groups, e.g. oncology patients[23], as a whole this patient cohort had poor interaction with modern educational tools such as the internet, and in general made little effort to seek further information. The need for active paper and verbal based interaction with this older more disadvantaged patient cohort must be recognised in order to tailor educational strategies to the unique needs of this population. This study shows a difference in health awareness between those at their first visit to the vascular clinic and those who were return patients. This indicates that the vascular clinic is a useful and effective point of entry to access knowledge about PVD and raise awareness. However, it also suggests that the primary care setting is a potential for intervention.

In patient education, it is important to target the patient population involved with culturally appropriate methods. The low use of internet among this patient cohort suggests that unlike other diseases with similar potential mortality, e.g. breast cancer, the internet at present is not an ideal mechanism of reaching the target population. The high number of patients who reported getting their information from their GP suggests that primary care represents an important gateway for PVD education. As this patient group reports low rates of active information seeking, community based screening and awareness programmes may be a valuable aid for primary and secondary prevention. Previous vascular screening pilot programmes in Europe and North America have yielded a high uptake in the public[3,19,24] and have shown some success in terms of patient education. A campaign was undertaken in Ireland some years ago to improve public awareness of PVD, however there was no associated screening programme.

Patients have a greater awareness of smoking as a modifiable risk factor than other strategies. Awareness of the harm of smoking was very different between first and return attenders at the vascular outpatients. This suggests that education by a medical professional can affect patients understanding and thinking about risk factors. Smoking cessation strategies in primary care are important in this cohort of PVD patients. There is potential to modify other risk factors for PVD by increasing awareness of risk factors other than smoking. The above results indicate that the level of knowledge of peripheral vascular disease and strategies for secondary prevention is low. Worryingly, knowledge is poorer among those most at risk; i.e. those with lower levels of formal education and current smokers. There is a need for innovative education strategies to engage this patient cohort, with a potential role for increased awareness in the primary care setting.

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Acknowledgements
B Whelan, Professor of Biostatistics, Trinity College Dublin, Ireland for his assistance and statistical advice on this project.

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Smoking in Vehicles is Lower than Mobile Telephone Use While Driving, but is Socially Patterned

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Abstract
Legislation is being considered which bans smoking in cars carrying children under the age of 16. This was an observational survey of smoking by drivers and passengers and mobile phone use by drivers in 2,230 cars over three time periods in two Dublin locations. The observed prevalence of mobile telephone use (2.56%) was higher than smoking (1.39%) ($p<0.01$), but was low in both. There was no significant variation according to time of day. There was an inverse pattern according to car value for smoking drivers ($p=0.029$). Eight adult passengers and just one child were observed as being exposed to a smoking adult driver. In conclusion, the public health importance of regulating passive smoke exposure is clear but the resources required to police such a ban in vehicles may be labour intensive for the yield in detection or prevention.

Introduction

A blanket ban on smoking indoors in the workplace and other public places such as bars and restaurants has been successfully implemented in Ireland since the March 2004 legislation.[1,2] However the focus now is on eliminating smoking in cars and other private vehicles where the hazardous air quality is dangerous to both the driver and any passengers in the vehicle, particularly children.[3] One of the biggest issues arising from smoking in a vehicle is the risk for the other passengers, particularly non-smokers not otherwise intentionally jeopardising their own health.

Evidence from the British Medical Association Board of Science demonstrates that the level of toxins in a smoke-filled vehicle could be 11 times higher than that of, for instance, a smoky bar due to the restrictive internal environment of a vehicle.[4] Second hand smoke (SHS) is a group 1 carcinogen and there is no recognised safe level of SHS exposure.[5] Children or young people, not yet fully developed physically and thus more at risk, are involuntarily being exposed to the toxins from SHS.[6] It is reported in the media that a diverse range of countries plan to, or already have, introduced legislation in this area, including Cyprus, Mauritius, Bahrain, South Africa, United Arab Emirates and some jurisdictions in Australia, Canada and America (http://en.wikipaedia.org/) though there is as yet little systematic evaluation of such legislation in other countries in the literature.[7]

The Irish government is planning as of 2012 to bring in legislation which bans smoking in cars carrying children under the age of 16. To date there is very little evidence on the prevalence of smoking in cars in Ireland. Studies in North America, the UK and Australasia, show substantial support for smoke-free environments in private vehicles, with more than 77% of smokers agreeing.[8] The other lifestyle hazard associated with driving is mobile telephone use. Using a mobile telephone while driving is extremely dangerous, as it affects the driver's performance, by distracting the driver both cognitively and physically.[9] In 2006, a legislative ban was introduced prohibiting the use of handheld mobile phones while driving. Again there is very little systematic evidence from Ireland on the number of people who still do so regardless of legislation. One study found that mobile telephone use while driving was associated with a fourfold increased risk of having a motor vehicle collision.[10] The aim of this study was to identify both the prevalence of smoking in vehicles and the use of hand held mobile telephones by drivers.

Methods

This was an observational survey in Dublin city conducted in spring 2012. Two locations were chosen adjacent respectively to UCD teaching hospitals St Vincent's University Hospital in the south-side and the Mater Misericordiae University Hospital in the north-side. Two observers were stationed at both the junction between Booterstown Avenue and the Rock Road, and the junction between North Circular Road and Dorset Street. The observers noted consecutive vehicles which were stopped at traffic lights. Each pair of observers had to record a minimum of 350 vehicles at each time slot (i.e. minimum of 1000 cars in total at each location). The study took place over two days between the times: 08:15 hours to 08:45 hours, 13:45 hours to 14:15 hours, 16:30 hours to 17:00 hours. If a driver or passenger was observed smoking or any driver was using a mobile phone in the car, the following data were recorded on a pre-piloted data sheet: gender, approximate age (<30 years, 30-65 years, >65 years), make, model and year of car, and specifically for smoking, whether the window was open and if there was anyone else in the car (adult, school going child (as determined by uniform) or younger child). For reference purposes an additional observation of all cars was carried out in one observation period at the Booterstown location to record the make, model and year of 200 cars which passed that junction. Data were analysed using SPSS work package; the chi-squared test was used for comparisons of proportions.

Table 1 Prevalence of smoking or mobile telephone use overall and according to location

Prevalence		Smoking n/N	Smoking %	Mobile Telephone Use n/N	Mobile Telephone Use %
Overall		31/2230	1.39	57/2230	2.56
Location	Booterstown	11/1146	0.96	48/1146	4.18
	Dorset Street	20/1084	1.85	9/1084	0.83
Time	Morning	11/776	1.41	26/776	3.35
	Lunchtime	8/726	1.1	17/726	2.34
	Afternoon	12/728	1.64	14/728	1.92

Table 2 Distribution of socio-demographic characteristics within smokers and mobile telephone users

Prevalence		Smoking n/N	Smoking %	Mobile Telephone Use n/N	Mobile Telephone Use %
Identity	Driver	29/31	93.5		
	Passenger	2/31	6.5		
Sex	Male	20/30	66.7	35/57	61.4
	Female	10/30	33.3	22/57	38.6
Age	″ 30 years	2/31	6.5	19/57	33.3
	30 – 65 years	27/31	87.0	33/57	57.9
	> 65 years	2/31	6.5	5/57	8.8
Type of vehicle	Car	25/31	80.6	50/56	89.3
	Van	6/31	19.4	5/56	8.9
	Taxi	0/31	0	1/56	1.8
Value	€350 - €4,000	13/27	48.1	9/53	17
	€4,001 - €7875	7/27	25.9	17/53	32.1
	€7,876 - €13,000	4/27	14.8	14/53	26.4
	€13,001 - 63,000	3/27	11.1	13/53	24.5
Other person beside smoker	Any adult	8/31	25.8		
	Child	1/31	3.2		

Results

Overall the observed prevalence of both smoking (1.39%) and mobile telephone use (2.56%) was low but the latter was somewhat higher ($p<0.01$) (Table 1). The observed rate in the south-side location was non-significantly lower for smoking but higher for mobile telephone use ($p<0.001$). There was no significant variation according to time of day ($p>0.05$) (Table 1) but more males than females were observed undertaking both activities and most were in the mid age range (Table 2). The majority were in cars rather than in vans or taxis and no lorry-drivers were observed. There was an inverse pattern according to car value for smoking drivers but no clear gradient was observed for mobile telephone use. The rates of smoking according to car value were calculated using the reference information and it was shown that smoking rates decreased markedly as the value of the car rose, from 2.05% in the lowest quartile of value to 0.5% in the highest quartile ($p=0.029$) but no significant association with car value was observed for mobile telephone usage. Eight adult passengers and just one child were observed as being exposed to a smoking adult driver in the survey.

Discussion

This survey has established a prevalence of both smoking and mobile telephone usage in vehicles in advance of any legislative change in relation to passive smoke exposure to minors in the capital city of the Republic of Ireland. Mobile telephone usage is already legally prohibited but we observed low but appreciable continued use, which was greater in the more affluent observation point. Other surveys in the country report somewhat higher but comparable rates.[11,12] There is immediate danger to road users from this practice and it is policed with penalty point sanction, though clearly difficult to enforce absolutely.

The observed prevalence of active smoking was low and the passive smoke exposure in absolute terms was modest in over two thousand vehicles observed, though a quarter of active smokers had an adult passenger who was exposed. By contrast with the mobile telephone utilisation patterns there was a social gradient observed, both at area level in that the rates were higher in the north-side of the city and inversely associated with car value. It is well established that active smoking has a strong social gradient[13] so less affluent drivers might be more likely to smoke also in their cars, a finding reported in a study very similar to our own in New Zealand.[14] Another observational study in inner city Dublin

found a higher prevalence of smoking in vehicles (14.8%)[15] but this might simply reflect the location. By contrast with mobile telephone usage, the rationale for banning smoking in cars is to reduce passive smoke exposure and hence is not related to immediate hazard risk but to the health consequences of exposure. Whilst the estimated burden of passive smoke exposure has been calculated the actual database for risk exposure is limited. A recent systematic review of the consequences of legislative bans to control passive smoke exposure included few studies that also measured car exposure.[7]

We were surprised to observe hardly any obvious work vehicles such as taxis or vans either with a smoking driver or a mobile phone user but both are already illegal under the workplace ban and mobile phone legislation. The public health importance of regulating passive smoke exposure is clear but the resources required to police such a ban in vehicles may be labour intensive for the yield in detecting or preventing the practice. It will take serious consideration by An Garda Síochána as to how in practice this might operate. It is possible that the existing legislation has already indeed had an impact on the practice since social support for that legislation is already very strong.

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Parental Experience of Enzyme Replacement Therapy for Hunter Syndrome

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Abstract
We aimed to establish the profile of Irish patients with Hunter Syndrome (Mucopolysaccharidosis type II, MPS II) receiving weekly intravenous Enzyme Replacement Therapy (ERT) with recombinant iduronate-2-sulfatase and to assess the social impact and parental opinion of ERT through the use of a parental questionnaire. Nine patients aged 3.5- 14 years have received a mean of 2 (range 0.5-3.5) years of ERT. Treatment was associated with clinical improvements from baseline in hepatosplenomegaly in 6/7 (85%) respiratory manifestations in 4/6 (67%) and a mean reduction in urinary glycosaminoglycan excretion of 62%. Changes noted by parents included increased energy 3/9 (33%) and softening of skin, hair and facial features 8/9 (89%). Parents report that seven hours weekly were spent on hospitalizations for ERT. Parental employment was adversely affected in 8 (89%) families. One day of school/preschool (20%) was lost every week for 8 (89%) children. All parents believed the benefits of ERT out-weigh the difficulties involved. All families would welcome the introduction of home based therapy. In conclusion the social and educational burden of hospital-based ERT on these children and their families is significant. The introduction of home-based therapy is likely to improve overall quality of life for MPSII patients and their families.

Introduction

Mucopolysaccharidosis type II (MPS II, Hunter syndrome, OMIM 309900) is a rare (1.3 per 100,000 male births) progressive, multisystem disease caused by an X-linked deficiency of the lysosomal enzyme iduronate-2-sulfatase[1-3]. This enzyme is responsible for the degradation of the glycosaminoglycans (GAGs) dermatan sulphate and heparan sulphate, and its deficiency leads to the progressive intra-lysosomal accumulation of GAGs in tissues and organs throughout the body. The signs and symptoms of MPS II may begin at an early age, with studies reporting a median age of onset at 18 months and typically the diagnosis is delayed, being made at a mean age of 6 years[4]. The presentation of MPS II ranges from mild to severely affected patients[3]. Manifestations include airway obstruction, skeletal

deformities, hepatosplenomegaly, ophthalmological changes, valvular heart disease, seizures, and progressive neurological decline[1,2]. Death usually occurs in early adulthood, with airway obstruction and cardiac failure being the most common causes[1,5]. Until recently, treatment for MPS II has been supportive, focusing on the individual management of the many signs and symptoms however the development of enzyme replacement therapy (ERT) using recombinant iduronate-2-sulphatase (idursulfase, Elaprase®) now presents the possibility of reducing the burden of GAG storage in patients with MPS II, with the aim of alleviating symptoms of the disease and slowing disease progression[4]. Data from clinical trials show that ERT with Idursulfase is well tolerated and that, in addition to reducing urinary GAG excretion, it has beneficial effects on growth, hepatosplenomegaly, physical function, stamina and respiratory function[4-7]. There is no evidence to date that intravenous ERT will have effects on the CNS manifestations of MPS II.

ERT has been available for the treatment of MPS II in Ireland since 2007. Treatment plans are co-ordinated and supervised from the National Centre for Inherited Metabolic Disorders (NCIMD) where patients are seen at least 6-monthly at specialist clinics. The aim of the study was to establish the profile of Irish patients with MPS II who are currently receiving ERT and to assess the social impact and parental opinion of ERT.

Methods

The medical notes of all patients attending NCIMD for treatment of MPS II were reviewed retrospectively to establish the pre-treatment patient characteristics and progress to date. All patients had multidisciplinary assessments annually (cardiology, psychology, physiotherapy, ophthalmology, ENT, Respiratory assessments, pulmonary function tests (where appropriate), sleep apnoea monitoring and abdominal ultrasound). Parents completed specially designed questionnaires on their experience of ERT either during a hospital admission or by phone with a single interviewer (MS).

Table 1: Parental opinion on ERT

Willingness for ongoing ERT therapy	9/9	100%
Psychosocial difficulties due to weekly hospital visits:	6/9 families	67%
• Patients	4/9	44%
• Parents	4/9	44%
• Other siblings	3/9	33%
Parental observation of effects of ERT on their child:		
• Improvement in skin/hair/facial features	8/9	89%
• Improved mobility	4/8	50%
• Improved behaviour	4/9	45%
• Increased energy levels	3/9	33%
• Increased confidence	2/9	22%
Negative aspects of ERT noted by parents:		
• Parental employment affected	8/9	89%
• School absence	8/9	89%
Preference for home ERT	7/9	78%

Results

Nine cases (8 male, 1 female) from 9 families were identified. Age range at time of study was 3.5-14 years. The mean age at diagnosis was 3.3 years (range 0.5-7).

Pre treatment characteristics

Respiratory complications included recurrent upper respiratory tract infections (n=7, 78%) and obstructive sleep apnea (n=6, 66%). Five (55%) patients had significant hearing loss and 3 (33%) had mild hearing loss. Cardiovascular complications included valve abnormalities (n=6, 67%) and ventricular hypertrophy (n=2, 22%). Hepatomegaly and splenomegaly were present in 7(78%) and 3(33%) children respectively. Seven patients (78%) had an umbilical hernia. Joint contractures were present in 8 (89%) patients. Carpal tunnel syndrome was present on electrophysiological testing in 3 (33%) patients. On psychology assessment 5 (55%) patients had normal intellectual function and speech, 2 (22%) had borderline IQ and 2(22%) had developmental delay. All patients had some coarsening of facial features with marked hirsutism in 3(33%). Mean urinary GAGs excretion pre-treatment was 58.4 (range 29-89 mg/mmol creatinine).

Treatment

Mean age at commencement of ERT was 4.8 years (range 2-11years). At the time of this study, patients had received on average 2 years of ERT (range 0.5-3.5years). Treatment was given at 6 different paediatric centres throughout the country. The majority of patients spent more than 5 hours on the weekly infusion (n=8, 89%) with a mean length of time of seven hours per week involved, including travel time, infusion time etc. All patients tolerated treatment well. Four patients (44%) had a skin reaction with the first infusion. In 5(55%) patients there was difficulty establishing intravenous access and central catheterization was required in 3(33%).

Post Treatment Characteristics

Following a mean of 2 years (0.5-3 years) of ERT, there was an improvement in sleep apnoea (4/6, 67%) and respiratory tract infections (3/7, 43%). Resolution of hepatomegaly (6/7, 86%) and splenomegaly (3/3, 100%) was seen. Cardiac function did not improve in any patient and progression of ventricular hypertrophy was seen in 3 (33%). On follow up psychological assessment, 2 new cases of ADHD were diagnosed, developmental delay was noted in 5 (55%) patients, 2 (22%) had borderline IQ and 2 (22%) had an IQ in the normal range. There were no changes in ENT assessment. Insufficient clinical data was obtained about joint mobility for inclusion. There was a 62% decrease in urinary GAG excretion (mean 17.8, range 5.8-39 mg/mmol creatinine).

Parental Questionnaire

Results are presented in Table 1. All parents were willing for their children to receive ERT. Six (67%) families admitted experiencing psychosocial difficulties due to weekly hospital visits for ERT. Various positive effects of ERT were noted by parents (table 1). Parental employment was adversely affected in 8 (89%) families with at least one parent giving up work or reducing availability for work. Eight patients (89%) miss 1 day per week of school/pre-school in order to receive ERT. The majority of parents stated they would prefer home ERT infusions (7/9, 78%). Two families, while broadly welcoming of the introduction of home based therapy, felt that the hospital system was preferable for their own situation at that point in time. All parents believed the benefits of ERT out-weigh the difficulties involved.

Discussion

MPS II is a rare, but very challenging progressive multisystem condition. Its management requires long-term multidisciplinary input. Treatment with Idursulfase was well tolerated by our patient group, and was found to reduce GAG excretion and to have positive effects on hepatosplenomegaly and respiratory manifestations in particular. As MPS II is a relentlessly progressive disease, year on year worsening of symptoms are expected. Comparable to other studies, no effect was seen on central nervous system or cardiac manifestations of MPS II[4]. ERT is currently administered intravenously and does not cross the blood brain barrier. Also, cardiac valves are relatively avascular and GAG accumulation and resultant valve deformation appears to progress despite ERT. It is no yet known whether this progression of valvular disease may be slowed by early and long term ERT.

Of interest is the large social burden on families that comes with weekly in-hospital treatment, including adversely affecting parental employment in all but one family and 20% loss of the schooling week for the child. This is a particular concern considering the educational challenges most of these children already face. The weekly commitment to treatment has resulted in negative psychosocial effects, as seen by some parents, for the child, siblings and parents themselves. Yet on the other hand, all of the parents reported positive effects of treatment on their child and feel the burden involved was outweighed by the benefits of

treatment. Home therapy with ERT is well established for other lysosomal storage diseases such as Fabry disease and MPS I[6,8] and a recent study has shown the beneficial psycho-socio and educational effects in a cohort of patients with Hunter Syndrome[5]. Access to hospital beds on a weekly basis has been problematic for some patients and home therapy should be seen as cost-saving in this regard. Similarly home therapy may be coordinated to fit in with normal family and school life. So far clinical data from United Stated and European centers supported the opinion that home ERT in MPS patients is safe provided it is initially performed under the supervision of experienced medical staff. Moreover, home ERT has been associated with improved compliance with the weekly treatment regimen[8]. In order to implement a successful home infusion program, appropriate training with clear clinical guidelines should be given to patients, parents and medical staff. Patients and their families should be counseled prior to home ERT about its potential complications[8].

In summary the introduction of home therapy would be welcomed by parents and is likely to improve quality of life for patients and their families.

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Acknowledgements
All of the families for their interest and participation.

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The World Health Organisation Analgesic Ladder: Its Place in Modern Irish Medical Practice

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Abstract
Pain is the single most common reason why patients seek medical care. Worldwide, there are 10 million new cases of cancer each year, with 6 million deaths annually. The World Health Organisation (WHO) first published Cancer Pain Relief in 1986, designed to be a simple, intuitive and accessible guide to the management of cancer pain that would be applicable and useful whatever the language, culture, economy, country and clinical setting. In Ireland today, we have ready access to many different opioids, and the WHO guidelines may seem inadequate and outdated. This article describes the evolution and use of the WHO guidelines, as viewed from the global perspective of its 193 member nations. The WHO ladder still remains valid today in Ireland, even as we await the imminent publication of new evidence-based national cancer pain guidelines this year.

Introduction

Worldwide, 10 million new cases of cancer occur each year, with 6 million deaths annually[1]. The World Health Organisation (WHO) Cancer Control Programme estimates that by 2020 this number will double, with 70% of cancer deaths occurring in developing countries, where most patients are diagnosed with late stage disease. Estimates reveal that 80% of terminal stage patients have no access to the analgesics they need[2]. In Ireland, an annual average of 29,745 cancer cases was registered during the three year period 2007-2009[3]. Our cancer and palliative care services are well-developed and we have ready access to many analgesics. Viewed from a purely Irish perspective, the WHO cancer pain guidelines may seem invalid and outdated. On the eve of the publication of new Irish national cancer pain guidelines this year, we review the critical role of the WHO guidelines in shaping cancer pain management.

Historical perspective

At the turn of the last century, newly developed surgical techniques, improved radiation technology and the emergence of the biomedical science field of oncology fuelled the nascent hope of finding a cure for cancer[4]. The prevailing cultural concept of the time viewed "suffering at the end of life as a spiritual or existential test of character". Pain was seen as an indicator of disease rather than a symptom worthy of treatment in its own right, whereas opioids were dismissed as the modality of last resort. Concerns over societal effects from opium dependence date as far back as 19th century Asia and the first Opium Convention was signed in The Hague in 1912. International and governmental policy since that time has chiefly related to drug control legislation and restriction of opioid supply, rather than recognition of the beneficial effects for patients in pain[2]. In tandem with increasingly restrictive legislature, deep societal concerns over narcotic addiction were increasing, both amongst the general public and amongst health professionals. Doctors began to prescribe opioids less and less, becoming de-skilled in their use, whilst a mystification arose around opioids themselves, not least the widespread belief that morphine hastens death.

During the 1950s, Raymond Houde, later joined by Kathleen Foley, began pioneering work assessing analgesic effectiveness[4,5], whilst in Washington John Bonica's early work culminated in the publication of the first modern textbook of pain medicine in 1953[6]. In parallel, the work of Cicely Saunders in establishing the foundations of palliative care and the modern hospice movement was a critical element in highlighting cancer

pain internationally as a public health problem. In 1982, at a time of changing societal attitudes towards the rights of the individual and the nature of suffering, Jan Stjernsward, head of the WHO's Cancer Unit, invited leading figures to a meeting in Milan, with the brief of developing a new global policy on cancer pain relief.

Cancer Pain Relief, 1986

All agreed the WHO recommendations had to be clearly understandable. A 'simple yet effective scheme' was planned and Cancer Pain Relief (CPR) was published in 1986 (the current second edition followed in 1996[7]). The booklet was translated into 22 languages[8] and has had significant clinical and educational impact across the globe [9]. The five fundamental tenets of the guideline are well-known: 'by the mouth', 'by the clock', 'by the ladder', 'for the individual' and 'attention to detail'. However, CPR provides much more than this simple guidance – in its 63 pages, it details an analysis of the causes of pain and guidance on the proper evaluation of pain. Whilst including discussion of non-drug measures and anti-cancer therapies, it emphasises that drug treatment is the mainstay of cancer pain management. A 'basic drug list for cancer pain relief' is provided, followed by a detailed discussion of the various recommended opioid and adjuvant drugs (including pharmacokinetics and side effect profiles).

The global consumption of morphine for medical purposes increased following publication of CPR in 1986[1]. Morphine is included on the WHO Model List of Essential Medicines[10] and is more readily and cheaply available in developing countries[11]. It was chosen by the WHO as the strong opioid of choice and remains the gold standard against which all other drugs are assessed. Comparative studies looking at morphine, oxycodone, hydromorphone, buprenorphine, fentanyl and methadone to determine which, if any, is superior are lacking. Newer drugs and drug formulations, such as modified release preparations, many transdermal patches, and rapid release fentanyl preparations are not included in the current edition of CPR, which has been criticised for not catering for those who are intolerant of opioids, those who suffer from complex pain, or incident pain, and those who don't respond to conventional drugs. CPR by design is simple, thereby enabling flexibility. It is a framework of principles rather than a rigid protocol. For those few countries who have ready access to many different opioids, the WHO guidelines may indeed seem inadequate, but viewed from the global perspective of its 193 member nations, it works. Where greater guidance is required, recommendations such as the 2012 European Association for Palliative Care guidelines[12] are readily available.

Opioid accessibility and cost

Narcotics are subject to both international and domestic controls. The Single Convention on Narcotic Drugs of 1961 supports the use of narcotics as indispensable for the relief of pain and suffering, and regulates their production, manufacture, import, export and distribution. Yet great disparity exists worldwide. Fears about opioid diversion, addiction and abuse continue to shape policy in some developed countries. Overregulation by excessively zealous restrictions, designed to restrict the diversion of opioids into illicit markets, has profoundly affected the availability of medicines for patients in pain, through creating such logistical obstacles to procurement as to produce a disincentive to the prescription of opioids at all. Examples include prescription limits, dose limits and permit requirements. Fear of regulatory scrutiny has been shown to impact on physicians' decisions about opioid use[13]. Illogical prescribing restrictions exist in some jurisdictions, such as opioid availability for post operative pain, but not cancer pain, or for adults but not children[9]. Across Europe, access to opioids varies considerably, with a marked East/West divide[14] (Figure 1).

Happily, increased emphasis on statutory responsibility and clinical competence for doctors –namely, a legal framework to support relief of pain- is proving a useful foundation[15]. A number

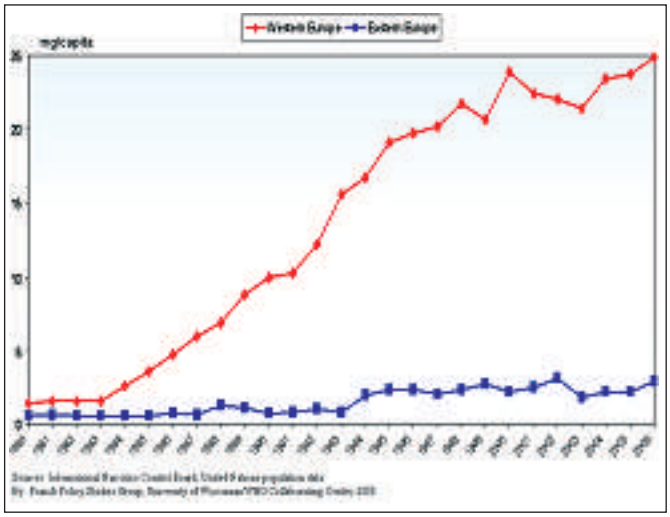

Figure 1 East versus West Europe: morphine consumption, average milligram per capita*, 1980–2006. *Average milligram per capita calculated by adding milligram per capita statistic for each country and dividing by the total number of countries.

of negligence cases have been successfully brought against doctors who under-treated pain in the US9. In 1998, the All India Lawyers Forum successfully filed a public interest suit in the Delhi High Court requesting state governments to simplify the procedures for the supply of morphine to patients. In response to difficulty accessing opioids for palliative care patients in Uganda, (where a doctor to patient ratio of 1:18 000-50 000 exists) the Minister for Health in 2004 made a regulation authorizing trained palliative care nurses to prescribe narcotic analgesics.

The cost of opioids is a central factor. Generic oral immediate release morphine is the most cost-effective analgesia, and a week's supply can cost as little as loaf of bread, or one US cent per 10mg. The cost to developing nations of commercially marketed modified release preparations or synthetic opioids are exorbitant, yet pharmaceutical companies are reluctant to provide oral immediate release morphine, as the profit obtained is minimal. Many nations cannot access affordable generic morphine, thus needing to produce their own supply domestically, or import expensive alternative opioids[11].

Discussion

The WHO guidelines, by their very definition as laid out 25 years ago, were designed as a global template which could be followed in any setting, in any nation, inexpensively and simply, whatever be the local language, culture or healthcare system and they have been very successful in their aims. However, different countries apply the WHO guidelines differently, depending on drug availability –without access to opioids the ladder remains useless. In some developed countries, like Ireland, with ready opioid availability and established palliative care programs, the guidelines have been seen as outdated and of limited validity in contemporary practice. I believe that the fundamental role that the guidelines should play, and have played, in the promotion of global change in pain policy and, centrally, in the support of improved access to opioid analgesics is the crucial consideration. Their clarity, unambiguity and flexibility, crystallized by the iconic 'clock' and 'ladder' imagery, have been successfully embraced across the globe, resulting in improved pain control for countless patients with end stage cancer. Long may they continue to do so.

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Best for the Child or to Reassure the Doctor!

Sir

We performed this audit to determine the need for follow up x rays in children with radiological & clinical evidence of pneumonia. This prospective study was undertaken in the Paediatric Emergency Department (PED) in a busy suburban children's Hospital. Patients who attended the Emergency department with clinical evidence of lower respiratory tract infection (LRTI) for whom the radiologist advised follow-up x-rays were recruited between January 1st to 30th June 2009.

43 patients were identified, 41 were suitable for the study, with a male to female ratio of 2:1. All patients were offered an appointment for clinical review and chest X ray (CXR) 4-6 weeks after initial presentation. Ten patients (23%) did not attend follow-up. On review -30 children were well with no symptoms, 1 child had persisting clinical and radiological signs. 31 children had CXR and 28 were then discharged from the clinic while 3 were offered respiratory OPD follow-up.

LRTI is a common presentation to the paediatrics Emergency Department. In our busy department we see 1600 children a year with this diagnosis. CXR is a valuable investigation used routinely for diagnosis of LRTI. The practice of doing a follow-up X ray has continued in many hospitals though the British thoracic Society recommends a clinical follow up[1]. We found only two published studies concerning this practice[2-4]. Our prospective study gives us the confidence to refer children with uncomplicated LRTI with CXR changes for clinical follow-up with the GP, thus saving unnecessary CXR and outpatient department visits. We recommend stopping the practice of follow-up CXR in children with uncomplicated Pneumonia. This will reduce radiation for our patients. We also recognise the family disruption caused by a day in our outpatient department and welcome an opportunity to ease this burden. Finally we believe that this practice is safe for children.

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Unknown Knowns – Where Did the DAMAs Go?

Sir,

Patients who Discharge Against Medical Advice (DAMA) suffer worse health outcomes and comprise a high mortality risk group[1]. DAMA patients may be exposed to a risk of an inadequately treated medical problem resulting in the need for re-admission.[2] Our aim was to reduce the potential risks associated with this high-risk group and implement a quality improvement plan. This was a retrospective study of medical DAMA patients between January 1st 2011 and December 31st 2011. The lead investigator reviewed the charts from Medical Records (31 in total) and completed a pre-designed questionnaire for each individual chart. Patients who left without being seen (LWBS) by either the Emergency Department or speciality team were excluded.

There was a DAMA rate of 0.79% which is in keeping with other similar studies which show a DAMA rate of between 1-2%.[3,4] Our study showed that the majority of DAMA patients were male (71%) and under 65 years of age. The DAMA readmission rate was 51.6% in comparison with an overall hospital readmission rate of 5.9%. The quality of the documentation was variable as there was no DAMA protocol in place. Our process map demonstrates the steps that should be taken when a patient decides to discharge against medical advice. However, our experience was that the vital steps regarding documentation were not being performed. 48% of DAMA patients had no follow-up plan and 71% had no discharge summary. Our study showed that 100% of DAMA patients were at risk of adverse health outcomes; however

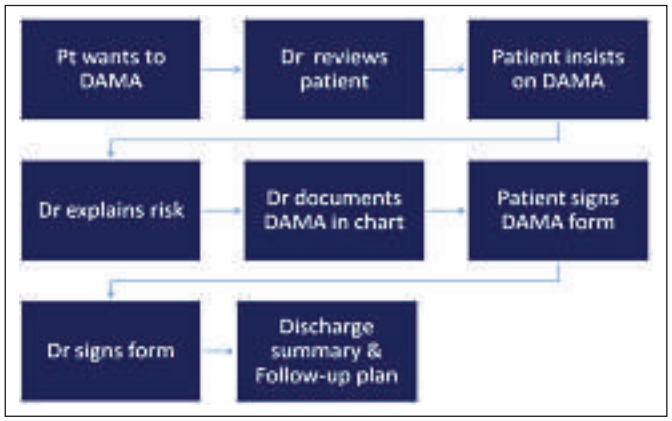

Figure 1 DAMA Process map outlining the steps involved when a patient wants to discharge against medical advice.

the DAMA form in use at the time of the study did not include the duty of care of the attending doctor to inform the patient of the associated risk. We therefore designed a new DAMA form to improve the documentation and minimize potential risk.

Thorough documentation is a vital step in minimizing clinical risk in an already high-risk group of patients. It is important to provide as much additional care as possible through discharge instructions and follow-up. Hospitals need to have more robust protocols for Discharge Against Medical Advice patients.

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The Cricoid Cartilage – A Useful Palpable Landmark to Identify The Recurrent Laryngeal Nerve

Sir,

The key of performing a safe thyroidectomy is to identify, protect and to minimally handle the recurrent laryngeal nerve during surgery. Improved understanding of anatomical variations of the recurrent laryngeal nerve has significantly reduced the incidences of vocal cord paralysis following thyroid surgery. Multiple surgical techniques and landmarks have been described in the literature to aid the identification of the RLN.[1-4] Cakir et al [4] carried a cadaveric analysis of the laryngeal anatomic features on sixty five adult autopsies and 130 RLNs. In his study he identified all RLNs inferiorly and traced them superiorly along the tracheo-oesophageal groove, and along the inferior hypopharyngeal constrictor muscle to the entry point on the medial side of the muscle.

The distances from this entry point to the inferior cornu of the thyroid cartilage, the inferior tubercle of the thyroid cartilage and the most anterior portion of the arch of the cricoid cartilage were 11 to 12mm, 22 to 24 mm and 26 to 28 mm respectively. Using these measurements he described a technique when two equal lines are drawn from any two of these points they will intersect at the point of insertion of the RLN. The cricoid cartilage is a constant landmark. The advantage of this over traditional surgical landmarks is that it is palpable and therefore can be used during open as well as endoscopic thyroidectomies. The lower border of the cricoid cartilage is a complete cartilaginous ring which is palpable as a groove or notch. This can be easily palpated once the thyroid lobe is rotated medially prior to identification of the nerve. The RLN invariably enters the larynx immediately inferior to this notch and can be found constantly once this palpable landmark is found.

In our technique a 4 to 5 cm cutaneous horizontal incision is made two centimetres above the sternal notch. A standard thyroidectomy surgical technique is performed to separate the strap muscles and enter the thyroid region to expose the gland's surface. The RLN is then identified prior to ligating the inferior and the superior thyroid vessels. The cricoid notch is located by running the index finger along the trachea, over the inferior thyroid

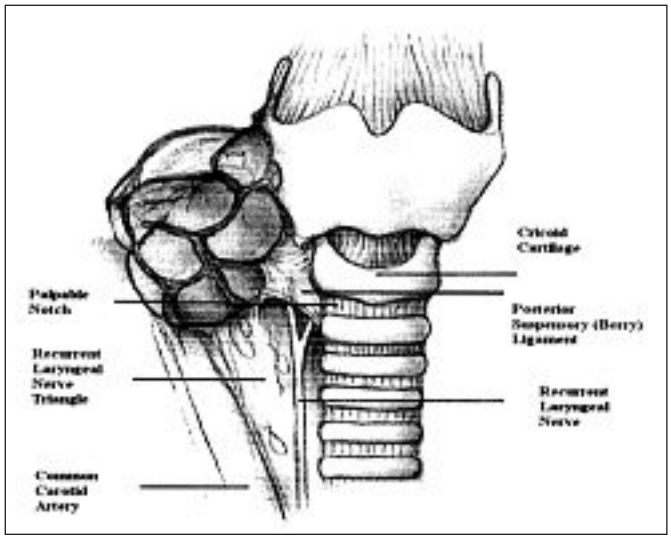

Figure 1 A sketch showing the course and relationship of the recurrent laryngeal nerve to the cricoid cartilage

vessels, until this landmark is palpated. Once located, tissues are dissected one centimetre inferior to this using a mosquito forceps opening in an anterior to posterior plane taking extreme care not to injure any small vessels in this region to avoid devascularisation of the vasa arteriorum of the nerve and to minimize post-operative dysfunction. This ensures identifying the nerve early with minimal tissue mobilisation. During endoscopic thyroidectomy a 2 – 3 cm skin incision is made, depending on the size of the gland, dissection is carried in a similar manner to the open approach, and the cricoid cartilage and notch can then be palpated using a Miccoli suction dissector®. Once the recurrent laryngeal nerve is located, the superior and the inferior thyroid vessels are ligated and a standard thyroidectomy is performed.

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Combined Endobronchial and Endoscopic Ultrasound-guided Fine Needle Aspiration: A One Stop Approach in Diagnosing and Staging Lung Cancer

Sir,

Accurate staging of patients with lung cancer is critical for the planning of treatment in lung cancer and should be achieved with as few procedures as possible. Endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA) and endoscopic ultrasound guided fine needle aspiration (EUS-FNA) have revolutionised the way we stage lung cancer and reduced unnecessary thoracotomies[1]. We describe 2 cases where a single combined EBUS-FNA and EUS-FNA enabled full staging of lung cancer, including extra thoracic metastases.

Case 1

66 year old male smoker presented with a 5 week history of voice hoarseness. Chest X-ray showed a left lung mass and subsequent staging CT scan showed a 4cm central bronchogenic lesion invading into AP window and abutting the lower end of trachea causing narrowing of the left upper lobe bronchus. Additionally, there was also an enlarged left adrenal gland highly suggestive of adrenal metastases. Bronchoscopy was performed with EBUS-TBNA of left paratracheal (station 4L) lymph node with a 22-gauge needle and followed immediately by EUS-FNA of the left adrenal gland under a single conscious sedation. The combined ultrasound examination staged the patient as T2N2M1b and histology from EBUS-TBNA and EUS-FNA confirmed stage IV adenocarcinoma of lung with metastatic spread to left adrenal gland. The patient tolerated the procedure well and without complications, and was discharged home the same day.

Case 2

59 year old female presented with right upper lobe cavitating lung mass with bilateral paratracheal lymphadenopathy and a left adrenal gland mass confirmed on staging CT scan. Linear array EBUS showed enlarged lymph nodes at ATS stations 4R, 4L and 10R. EBUS-TBNA of nodal station 4R was performed with a 22-gauge needle and confirmed metastatic adenocarcinoma of the lung. This was followed by EUS-FNA of left adrenal gland mass under the same conscious sedation which subsequently demonstrated extra-thoracic metastatic disease. Histology from this combined procedure confirmed stage IV adenocarcinoma of the lung.

Discussion

Mediastinal and extra thoracic metastases are a common finding in lung cancer. It is essential to stage lung cancer patients accurately in order to avoid futile thoracotomies. Enlarged or positron emission tomography (PET) positive left adrenal glands are suspect for distant metastases and require tissue confirmation for a definitive diagnosis[2,3]. EBUS-TBNA allows accurate staging of the mediastinum, whereas EUS-FNA enables staging of nodal stations not accessible to EBUS and the adrenal glands.

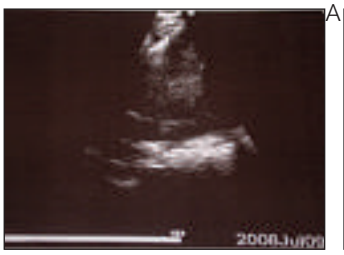

Figure 1 EBUS-TBNA of station 4L

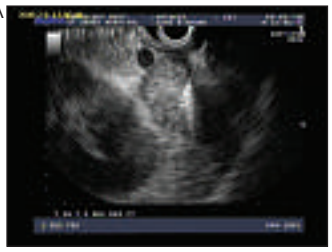

Figure 2 EUS-FNA of left adrenal gland

combined EBUS-TBNA and EUS-FNA under a single conscious sedation enabled complete staging of lung cancer in these 2 patients, including extra-thoracic metastases in a single session. These minimally invasive procedures eliminate the need for costly imaging techniques and invasive surgical procedures with potential savings in both time and costs. The combined use of EBUS and EUS allows a one-stop approach for the pathologic diagnosis and staging of lung cancer with a more comprehensive access to mediastinal and hilar lymph nodes and extra-thoracic sites when compared to mediastinoscopy[4,5].

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Continuing Professional Development

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

Bicycle Helmet Wearing in a Sample of Urban Disadvantaged Primary School Children

MB Quirke, S McGilloway, CM Comiskey, C Wynne, K O'Sullivan, E Hollywood. Ir Med J. 2013; 106: 102-4.

Question 1
The proportion of children who owned a bicycle was

a) 56%
b) 66%
c) 76%
d) 86%
e) 96%

Question 2
The children in the study were aged

a) 5-13 yrs
b) 6-13 yrs
c) 7-13 yrs
d) 8-13
e) 9-13 yrs

Question 3
The proportion of children who never wore a helmet were

a) 40.4%
b) 50.4%
c) 60.4%
d) 70.4%
e) 80.4%

Question 4
The proportion of girls who wore a helmet was

a) 41%
b) 51%
c) 61%
d) 71%
e) 81%

Question 5
The proportion of boys who wore a helmet was

a) 19%
b) 29%
c) 39%
d) 49%
e) 59%

Factors Affecting Receipt of a Medical Card in a Cohort of Colorectal Cancer Patients, 2002-2006

J McDevitt, L Sharp, D MacDonald, F Dwane, H Comber. Ir Med J. 2013; 106: 110-3.

Question 1
The number of colorectal cancer cases in patients under 70 years 2002-2006 was

a) 1000-2000
b) 2001-3000
c) 3001-4000
d) 4001-5000
e) 5001-6000

Question 2
In terms of cancer frequency, colorectal cancer is

a) the commonest cancer
b) the second commonest cancer
c) the third commonest cancer
d) the fourth commonest cancer
e) the fifth commonest cancer

Question 3
The proportion of patients under 70 years who a medical card at the time of the colorectal cancer diagnosis was

a) 12%
b) 22%
c) 32%
d) 42%
e) 52%

Question 4
The proportion of patients who received chemotherapy was

a) 10-20%
b) 21-30%
c) 31-40%
d) 41—50%
e) 51-60%

Question 5
The proportion of patients aged 60-69 years was

a) 16%
b) 26%
c) 36%
d) 46%
e) 56%

Smoking in Vehicles is Lower than Mobile Telephone Use While Driving, but is Socially Patterned

I Gilroy, N Donnelly, W Matthews, K Doherty, G Conlon, AT Clarke, L Daly, C Kelleher, P Fitzpatrick. Ir Med J. 2013; 106: 118-20.

Question 1
The proportion of drivers observed using a mobile phone was

a) 1-2%
b) 2.1-3%
c) 3.1-4%
d) 4.1-5%
e) 5.1-6%

Question 2
The proportion of cars where the driver or passengers were smoking was

a) 0.5-1%
b) 1.1-1.5%
c) 1.6-2%
d) 2.1-2.5%
e) 2.6-3%

Question 3
The total number of vehicles in the study was

a) 1-500
b) 501-1000
c) 1001-1500
d) 1501-2000
e) 2001-2500

Question 4
The number of observer locations was

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

Question 5
The proportion of the vehicles that were vans was

a) 0-3%
b) 4-6%
c) 7-10%
d) 11-13%
e) 14-16%

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