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NZMSJ

New Zealand Medical Student Journal

Te Hautaka o ngaa Akongaa Rongoaa

DIVERSITY IN SURGERY

A WORKFORCE FOR THE FUTURE

TRAFFIC LIGHT LABELLING SYSTEM

Will it improve our food choices?

SENTINAL NODE BIOPSY

Malignant melanoma

PUBLICATION BIAS

In the field of subfertility


ANTIMICROBIAL STEWARDSHIP:
RESISTANCE IS FUTILE
Increasing antimicrobial resistance is a worldwide problem, compounded by the lack of new antimicrobial medicines. Prudent use of antimicrobial medicines is our best strategy to counter this emerging threat.
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Issue 22 and beyond

Cheyaanthan Haran
Deputy Editor
5th Year Medical Student
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Ahmed Abdile
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Welcome to Issue 22 of the New Zealand Medical Student Journal (NZMSJ)! This issue delivers excellent articles from a wide range of areas in medicine.

Medical publishing has inherent publication bias. Vanessa Shen has produced a detailed article investigating publication bias in subfertility literature. She has clearly highlighted how this impacts physicians and policymakers who rely on accurate and unbiased data for decision making.

Authors Henry Wallace and Cameron Wells, in separate articles, have weighed the physical and psychological risks of sentinel node biopsy in melanoma. In another article, Atif Slim — a past editor of the NZMSJ, presents a case report of Group A streptococcal meningitis. With two-thirds of the New Zealand population being overweight or obese, making healthy food choices is a national imperative. One initiative that aims to address this issue is a traffic light food labelling system. Katherine Given has analysed and given a thorough overview of the current arguments for and against traffic light food labelling. Issue 22 also includes three insightful and thought-provoking book reviews of: *When Breath Becomes Air*, *Being Mortal,* and *Five Days at Memorial*.

Our Journal has come a long way since 2004. We continue to publish original, high quality articles from students across New Zealand. It is important that we constantly look to improve. An area of improvement is maintaining continuity of vision within the NZMSJ editorial board. Normally, the editors of the NZMSJ are involved for two to three years before they graduate. This results in a high turnover rate of editors, where the team are operating with a different vision on a year to year basis. This variance in approach is welcomed, as it injects creativity and brings in a wider set of ideas. However, in the long-term, the Journal needs continual foresight to adapt and navigate the ever changing medical research landscape. One way to address this question is to implement an Advisory Board.

The Advisory Board will consist of expert members interested in nurturing and cultivating medical student research, with the aim of providing governance and direction to the NZMSJ over a long-time frame. We have received support and assistance from both medical schools, Otago and Auckland. By the release of the next issue in November, we aim to have this team of experts confirmed.

In the meantime, we hope you find lots of interesting material to read in Issue 22, which will further your love for medical literature and research. Our final congratulations to the authors who have published for their very first time and to our returning authors.

For more information about how to submit your work, see our website nzmsj.com/submission.

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Diversity in surgery

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INTRODUCTION

The concept of diversity encompasses acceptance and respect. It means understanding that each individual is unique, and recognizes our individual differences. These differences can be along the dimensions of race, ethnicity, gender, sexual orientation, socio-economic status, age, physical abilities, religious beliefs, political beliefs, or other ideologies. These differences should be explored in a safe, positive, and nurturing environment. It is about understanding each other and moving beyond simple tolerance to embracing and celebrating the rich dimensions of diversity contained within each individual.[1]

Each and every doctor takes ownership of the environment in which they work. As surgeons we are the owners of the legacy of surgery, we work in today's surgical world and we will be responsible for the future of surgery.

Some say that the legacy of surgery is that of a male dominated, misogynistic community, closed to the outside world. Diversity in the surgical workforce is changing that legacy and today's surgical community is becoming increasingly diverse in keeping with modern social trends and demands. There is considerable evidence that diversity improves work culture as well as giving patients greater choice.

The Royal Australasian College of Surgeons (RACS) is actively embracing diversity in surgery by addressing the past inequities of women in surgery, and in Māori, Aboriginal and Torres Strait Islander representation.

WOMEN IN SURGERY

Currently 10.6% of surgeons across Australia and New Zealand are women, although this is predicted to change as 39% of current trainees are women, and 40% of recurrent successful SET applicants are now female. The College recognizes that lifestyle factors are important in choosing a surgical career, but interventions to improve diversity should be targeted at all trainees.

Factors that have been identified as barriers to diversity include; lack of flexible training opportunities, inaccessibility of leave and lack of independent and specific support, particularly family and career responsibilities.

In a recent 'Medicine in Australia: Balancing Employment and Life' (MABEL) research forum held in Melbourne in May 2016 speakers talked about the hurdles to flexibility in specialist training and found that specialists in training seem to have less flexibility than other doctor types (e.g. general practitioners, and hospital medical officers). This issue affects women more, and as a result, this is an extra hurdle in the path to specialization. Study results have found that women are more likely to temporarily leave clinical practice when they have a newborn or 1-2 year old child. When working they do not reduce their hours as much as other groups and usually remain more than 40 hours per week. It seems that an all or nothing approach to achieving specialist qualifications still occurs. Specialist registrars were found to be more restricted in employment by lack of childcare, as irregular hours do not match with traditional childcare hours of operation.

RACS and its training boards are currently exploring options for less than fulltime training, and are working closely with jurisdictions and employers to facilitate this. It is hoped that by providing greater flexibility during training, the surgical workforce will eventually come to reflect a more equitable gender balance.

MAORI IN SURGERY

In 2014, only 3.2% of medical practitioners in New Zealand identified as Māori (up from 2.7% in 2013). As the total size of the medical workforce in 2014 was 15366, this means that there were roughly 490 Māori doctors at the time.

In 2014, there were 34 Māori graduates from New Zealand medical schools. In 2015, 75 of the new medical students were Māori (about 15% of the total domestic intake of 503). Due to these increasing numbers, it is expected that Māori as a proportion of the medical workforce will continue to grow. The challenge for RACS is now to encourage these Māori students into surgery.

Unfortunately, Māori representation in the surgical workforce is relatively low. RACS' last Fellowship Survey has the number of active Fellows who are of Māori descent listed as 11. We do not know how many Māori trainees we have currently, although this is something we will be able to find out in the near future as this data is now being collected.

To address these low numbers, RACS has committed to developing the surgical workforce to be representative of Māori in New Zealand. As the number of Māori medical students is now higher than ever, it is hoped that

by providing greater access to resources and support, from medical student through to surgical trainee, more Māori will be encouraged and enabled to pursue a career in surgery. The Royal Australasian College of Surgeons is now actively working with Te Ora, the Maori Medical Practitioners Association to actively recruit Maori into surgical careers by presenting at medical student gatherings, offering scholarships to attend the College Annual Scientific Meeting and regional student events to encourage students to take surgical options.[2]

ABORIGINAL AND TORRES STRAIT ISLANDERS IN SURGERY

Aboriginal and Torres Strait Islanders comprise approximately 3 percent of the Australian population. In 2012, the admission of Aboriginal and Torres Strait Islanders to medical studies reached parity to the population statistics, that is just under 3% of medical students admitted to medical school were of Aboriginal and Torres Strait Islander descent! This was an exciting moment in Australian history and a representation of the strong future ahead. Unfortunately on graduation from medical school, Aboriginal and Torres Strait Islanders do not pursue a career in surgery in the same proportions as the non-indigenous population, despite showing a keen interest during medical school.

RACS acknowledges that Aboriginal and Torres Strait Islander membership of the Surgical Education and Training (SET) Program and of the Fellowship does not reflect either the demography of Australia or the general uptake of surgery as a career by medical graduates. Of the current Fellowship of over 6000, only two Fellows have identified as Aboriginal. There is a strong sense that the professional inequality should be addressed.

There are positive benefits to all the community in the areas of social advancement and indigenous health, but also the general community benefit from different perspectives, when indigenous peoples are represented in the medical workforce and in surgery in particular.

Based on 2013/14 statistics published by the Medical Board of Australia 5,422 registered medical practitioners had specialty registration in surgery, which is 5.4% of the total registration of 99,379.

The RACS initiative is designed to address the low participation of Aboriginal and Torres Strait Islander doctors in the surgical specialties that RACS trains in. RACS aims to increase the number of Aboriginal and Torres Strait Islander surgeons in the Fellowship.[3]

GENERATIONAL DIVERSITY IN SURGERY

There is no doubt that there is a generational diversity in medicine as a whole. The selection and training of surgeons and surgical leadership tends to be the responsibility of the older generation of surgeons (the baby boomers) and the stellar pool of applicants is from the "generation X and Y" populations. The older generation tend to have a work related life balance, are motivated by inspirational speeches, have an expectation of leadership roles and have a high work ethic. The younger generations on the other hand have a greater lifestyle focus, lead if necessary and are streetwise and tech savvy. By not accepting the changing attitudes and motivations of young trainees and medical students, the older generation of surgeons may disenfranchise a high percentage of potential future surgeons.[4]

In addressing the current inequity of diversity in the surgical community the Royal Australasian College of Surgeons aims not only to advocate for quality and high standards in surgery but also to produce a diverse and vibrant surgical workforce for the future.

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Publication bias in the field of subfertility

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ABSTRACT

Publication bias, the selective publication of studies reporting statistically significant outcomes, can affect the total evidence available and may eventually compromise patient care. This study aims to assess whether the statistical significance of Randomised Controlled Trials (RCTs) abstracts in the field of subfertility correlates with their subsequent publication as full-text articles.

Abstracts presented at conferences from 2007 to 2009 captured by the Cochrane Menstrual Disorders and Subfertility Group Specialised Register (MDSGSR) were screened. Eligible abstracts included RCTs that investigated a fertility intervention and reported at least one reproductive outcome. Articles were searched on electronic databases including Embase, Pubmed, MEDLINE and CINAHL. Data were then extracted from the articles using a structured form. Authors were contacted if the articles were not found in the search.

Overall, 229 out of 337 RCTs retrieved were eligible, with 48% of 229 abstracts subsequently published. Preliminary analysis indicates that 38% were oral presentations, 1% were registered, and 3% were interim or preliminary analyses, 10% of studies acknowledged industry funding while the source of funding was not reported in 69%.

There was a statistically significant difference between the probability of abstracts reporting statistically significant outcomes and those reporting non-statistically significant outcomes being published (59% versus 43%, p=0.03). Of studies reporting non-significant results, 13% made a positive statement about their findings. This study suggests the presence of publication bias in the field of subfertility.

INTRODUCTION

Well designed Randomised Controlled Trials (RCTs) are the cornerstone of evidence-based medicine.[1,2] However, it has been suggested that many RCTs are either not submitted or not accepted for publication.

Publication bias is a phenomenon in which the probability of publication is influenced by the study result. The selective publication of articles that show statistically significant outcomes, or beneficial treatment effects, can affect the body of evidence available for physicians and policymakers to base their decisions. If the RCT fails to show any treatment difference, the researchers may be influenced by the results and lose interest in completing the study.

If the researchers produce a manuscript showcasing their negative findings, journal editors may fail to publish it as they consider such information less appealing to readers. Even when an RCT with non-statistically significant results gets published, it is unlikely to be in a high profile journal.[3] Hence, publication bias can arise due to the overexposure of positive result trials in leading journals. This in turn may lead to overestimation of treatment effects.

Meta-analysis is a method for combining the results of similar studies to give an overall indication of whether a specific intervention is beneficial or harmful for a specific health condition. Evidence based medicine relies increasingly on meta-analyses which are considered the top tier of evidence used by policy makers and physicians to make clinical decisions. As meta-analyses can be distorted by publication bias, the extent and consequence of this bias warrants investigation.

The problem of publication bias may be particularly likely to occur when the research is sponsored by entities with a vested financial interest in achieving positive results, such as pharmaceutical companies, as was highlighted in the recent Tamiflu controversy.[4] This highlights the need to examine the presence of publication bias in RCTs, especially those sponsored by pharmaceutical companies.

Ultimately, publication bias may contribute to inappropriate treatment decisions for patients that compromise their quality of care, and lead to the emergence of suboptimal healthcare policies and thwarted planning of future research that further deteriorates patient care standards.

AIM

This study aims to investigate if there is an association between the statistical significance of results reported in RCT abstracts and their subsequent publication as full-text articles from a cohort of abstracts from the Cochrane Menstrual Disorders and Subfertility Group Specialised Register (MDSGSR).

METHODS

Search strategy

The study started with a search for abstracts of RCTs from years 2007 to 2010 in the MDSGSR.

Selection criteria

Two authors independently screened all the abstracts to identify those that meet the eligibility criteria. Eligible studies had to be RCTs that investigated a fertility intervention, such as In-vitro fertilisation (IVF) or intrauterine insemination (IUI), and reported at least one reproductive outcome, such as pregnancy rates or implantation rate. Studies that solely reported endocrine or biochemical outcomes were excluded. After the screening process, any discrepancies in the list of included abstracts were resolved by consensus or consultation with a third author.

Data collection

Data was extracted from eligible abstracts. Information collected from the abstracts included title of abstract, list of authors involved, type of presentation (oral or poster), funding source, whether the study was registered, type of outcome (statistically significant or non-statistically significant), stage of study and country of origin. If a study was not stated to be in an interim stage, it was assumed to be completed.

Article publications were identified. A search for article versions of all included abstracts in the databases Embase, Pubmed, MEDLINE and CINAHL was carried out using the following match criteria: matching trial registry numbers and/or matching some of the same authors, and having an identical or very similar title, methodology and research question to the initial abstract.

Data was extracted from the article publications and the following information were collected: title of publication, list of authors, publication status, month and year of publication, name of journal and funding source.

Data analysis

Finally, data collected from this study was analysed. Characteristics of included abstracts were presented in a table format. The odds ratios were generated to evaluate whether there was a statistically significant difference between publication rates of studies with significant versus non-significant outcomes. All results were presented with 95% confidence intervals and associated p values, as appropriate. Tests were performed using a two-sided P-value of less than 0.05 for statistical significance.

Results

Of 327 abstracts screened from the MDSGSR, 229 abstracts were selected based on the eligibility criteria (Figure 1). Article publications were found for 111 article publications, representing a publication rate of 48%.

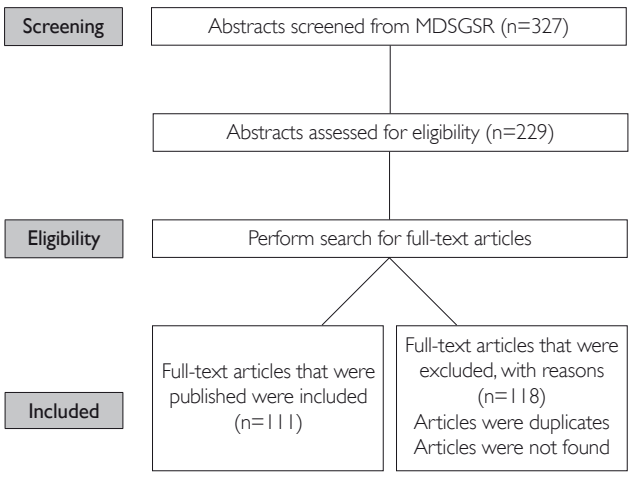

Figure 1. Flow of studies

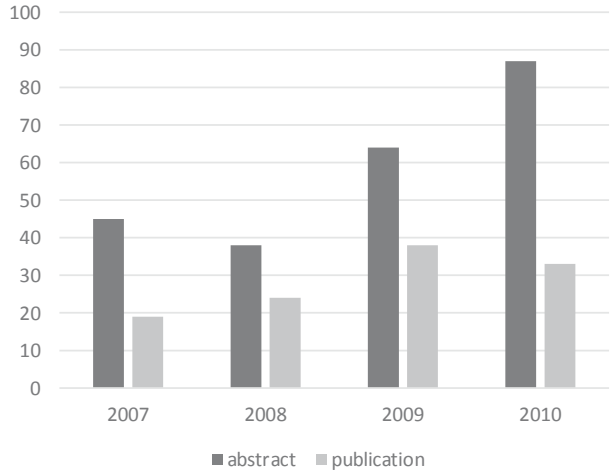

Figure 2. Comparison between number of abstracts versus article publications from 2007- 2010

Table 1 demonstrates a summary of the characteristics of the eligible abstracts, which also includes the percentage of trials in each category that were subsequently published. 38% of abstracts were oral presentations, the majority of abstracts originated from Europe and Asia, 1% were stated as registered, and 3% were stated as interim analyses. 10% acknowledged industry funding while the source of funding was not reported in 69% of studies.

A higher proportion of abstracts presented orally were found to be published than those presented in the form of a poster, with the difference being statistically significant (p=0.002). Abstracts originating from the UK and Australia/New Zealand also had a higher publication rate 71% & 65%. There was also a statistically significant (p=0.03) higher rate of publication for abstracts reporting significant versus non-significant outcomes. However, when the definition of statistically significant outcomes widened to encompass abstracts reporting non-significant outcomes yet positive findings , the difference in publication rate became non-statistically significant (p=0.23). Also, no differences were found when comparing the publication rates of articles with a difference in registration status and stage of study.

Figure 2 illustrates a comparison of the proportion of abstracts that were eventually published as articles over time. There is an overall increasing trend in the proportion of abstracts published as articles with the progression of time from 2007 to 2010. A statistically significant difference was found with regards to the proportion of abstracts published in subsequent years (p= 0.009).

DISCUSSION

It remains unknown how many RCTs on subfertility are never submitted to a scientific meeting. This discussion aims to explore and explain the different statistical findings derived from the current study, reflect on challenges faced in this study and comment on various methods that could be used to manage the problem of publication bias in medical research.

Of all abstracts of RCTs presented in the European Society of Human Reproduction and Embryology (ESHRE) and American Society for Reproductive Medicine (ASRM) annual meetings (2007-2010), 48% were found to eventually reach article publication status in scientific journals.[5, 6] Based on the current study conducted, the outcome of RCTs (statistically significant versus non-significant results) and country of origin affected the rate of publication. RCTs reporting statistically significant results, or positive outcomes favouring a new therapy, had a greater likelihood of being published, thus confirming the presence of publication bias in the field of subfertility. This may lead to an overestimation of the effects of subfertility therapy in the study.[5] These findings highlight that by using only published literature to examine the effectiveness of a new treatment, one could get a biased and inflated perspective of the treatment. It would be unethical

Table 1. Characteristics of subfertility abstracts screened from MDSGSR and publication rate

characteristics of MDSGSR subfertility abstracts	total number of abstracts (%)	number of published abstracts (%)	p-value
Type of presentation			
oral	88 (38)	56 (64)	0.002
poster	141 (62)	60 (43)	
Location of country			
UK	7 (3)	5 (71)	
South America	16 (7)	6 (38)	
Europe	74 (33)	39 (53)	
North America	44 (19)	19 (43)	
Asia	71 (32)	30 (42)	
Other (Pacific)	17 (6)	11 (65)	
Funding source			
Industry	24 (10)	12 (50)	
Government/Institution	11 (5)	7 (64)	
Charity	3 (1)	2 (67)	
None	33 (15)	12 (34)	
Not reported	158 (69)	77 (49)	
Any outcome			
Statistically significant	73 (32)	43 (59)	0.03
Non-significant			
Where definition of statistically significant outcome includes non-significant outcome with positive statement			
Statistically significant	94 (41)	50 (53)	0.23
Non-significant	135 (59)	61 (45)	
Registered			
Yes	3 (1)	2 (67)	0.56
No	226 (99)	112 (50)	
Stage of study			
Interim	6 (3)	5 (83)	0.12
Complete	223 (97)	106 (48)	

to falsely claim a treatment as effective based on a lacking in totality of evidence identified (both published and unpublished).

These results are in agreement with the findings of a meta-analysis, which found a publication rate of 51% for abstracts presented at 11 surgical, cardiology, anaesthesiology, paediatric, oncological, perinatology and ophthalmological meetings.[6] Another finding in agreement with this study is that RCTs accepted for oral presentation had a significantly higher chance of eventually getting published than poster presentations (p=0.002). This could be explained by higher quality research being reflected in better written abstracts which then qualified preferentially for oral presentations at the annual conference meetings, and by the same token for publication in the more prestigious journals.

Previous reports have shown that the lack of subsequent publication is often due to the lack of submission rather than rejection of manuscripts.[7, 8] This was usually due to lack of resources such as time, or loss of interest of authors in the study due to negative results produced not favouring a particular therapy.[9, 10] The survey of authors of unpublished RCTs will be conducted in the later phase of this study.

The influence of sponsorship has been explored in a limited number of studies. External funding was associated with a higher rate of full publication in two studies.[11, 12] The role of pharmaceutical industrial funding has been addressed in two studies, both of which found pharmaceutically sponsored trials to be less likely to be published.[13, 14] The data suggested that sponsorship by pharmaceutical industries acted as a moderate predictor of publication, with such studies producing the third highest rate of publication, after studies sponsored by charities and governmental institutions. The discrepancies between these study findings and those of previous studies might be due to a change in trends with time and inclusion of only RCTs, whereas previous reports included observational and case control studies.

Potential limitations of this study included the use of abstracts to identify trials, the limited range of abstracts screened in the MDSGSR and insufficient time to contact authors of unpublished studies. The disadvantage of using conference abstracts to screen for trials was that authors might be less inclined to submit abstracts reporting non-significant outcomes.[15] This may underestimate the effects of publication bias, as there may be many trials out there that were never presented at conferences or subsequently published.[16,17] The limited number of abstracts screened, and the specialized field of subfertility resulted in a smaller sample size for this study. This makes it challenging to reflect the true extent of publication bias in the general medical literature for this field solely based on these study results.

CONCLUSION

Although the collection of RCTs presented at scientific meetings in this study did not capture the entirety of RCTs performed in the field of subfertility, it still provided a useful filter to examine the presence of publication bias. By investigating all subfertility studies captured in the MDSGR we confirmed that publication bias does exist. We strongly urge funding agencies, governmental Institutions, health policymakers, researchers, and clinicians to work together to eliminate this important and increasingly serious problem.[18, 19] Possible methods that could be used to manage publication bias include an improved research standard that mandates the pre-registration of protocols for RCTs, performing higher powered RCTs by increasing size of study and increasing the use of online open access journals which may actively encourage the publication of negative results.[20 21]

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Are the physical and psychological risks of a sentinel lymph node biopsy in melanoma worth the information gained?

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BACKGROUND

Sentinel lymph node biopsy (SLNB) in melanoma is a procedure without proven overall survival benefit.[1] Like any surgery, it also has the potential to physically and emotionally harm patients. Despite this, the procedure provides regional disease control and accurate disease staging.[1] These factors can potentially ease patient suffering, increase disease-free survival and provide powerful prognostic information to patients and clinicians alike, the significance of which cannot be discounted.[2]

A sentinel node is the first lymph node to which afferent lymphatic vessels from a body site drain. Studies have proven that sentinel nodes are common initial sites of metastasis in melanoma.[3] After the administration of local anaesthesia, standard SLNB procedure involves intradermal injection of technetium-99m–labelled radioactive colloid and isosulfan blue dye around the melanoma.[3,4] This mixture then drains through the afferent lymphatic system arriving at the sentinel node 10-30 minutes later.[5] The general location of the sentinel node can then be identified trans-dermally with a gamma-sensor, and an incision made in the skin. The sentinel node is then identified by the blue colour it takes on from the isosulfan blue dye, excised, and subjected to pathological examination for any signs of melanoma metastasis.[5]

The above procedure is generally indicated if a primary melanoma is >1mm thick or has other adverse features (e.g. ulceration).[6] There is still uncertainty about the role of SLNB in thin (<1mm) or thick (>4mm) primary melanomas because such patients are already at such a low or high risk of metastatic disease respectively.[1,3] This essay will therefore focus on the advantages and disadvantages of SLNB in patients with an intermediate thickness (1-4mm) primary lesion, as this is the group in which most sentinel node biopsies are undertaken (due to international guidelines) and the most extensively researched group.

ALTERNATIVES

The alternatives to SLNB are to watchfully wait for clinically detectable nodal disease to occur, or to remove all the lymph nodes in the regional basin without checking the sentinel node first – a 'therapeutic lymph node dissection'. Studies have shown that if sentinel nodes are pathologically negative for metastatic disease, then surrounding nodes are also unlikely to contain micro-metastases.[5,6] The principles behind SLNB are thus: firstly to prove that the sentinel nodes are clear of metastasis, and spare the patient from undergoing therapeutic lymph node dissection; and secondly, to be more proactive in the staging of the melanoma than watchfully waiting for signs of clinical disease.[3] In practice, the only alternative to SLNB is observation, as therapeutic lymph node dissection is a major procedure that is not routinely undertaken without pathological or clinical evidence of nodal disease.[7]

Depending on the results, sentinel node biopsies have the potential to send patients down one of two very different pathways. If a sentinel node is found to contain metastatic deposits, the melanoma is classified as stage III disease that has a five year survival of 39-70% depending on the total number of nodes affected.[8] This is an indication for therapeutic lymph node dissection, which has been shown to significantly reduce regional disease morbidity in addition to increasing disease free survival.[5] The presence of regional node involvement is also an indication for adjuvant therapies that can involve participation in clinical trials with novel agents such as ipilimumab or treatment with high-dose interferon alpha.[8,9] Disease free survival is increased by Interferon alpha therapy, and even more encouragingly, Ipilimumab has been shown to increase the all-cause survival in stage IV melanoma and possibly earlier.[9,10] Hence if a patient failed to undergo SLNB, their access to these disease controlling and potentially life prolonging therapies could be delayed.[10]

Conversely if a node is found to be pathologically negative this is a good prognostic indicator, with one study reporting >80% survival at 5 years.[11] This same study reported a false-negative rate of 3.4%, but the outcomes for these patients were similar to those undergoing nodal observation. Aside from the physical and psychological risks discussed later, undergoing the procedure did not disadvantage them.[10] One can imagine that getting such positive prognostic information would provide significant psychological relief to patients, reducing some of the stress, anxiety and depression, which are highly prevalent in cancer patients.[12] This psychological benefit may then

even translate to physical health benefits, as a result of the reduction in stress and emotional unloading.

The best evidence for SLNB vs. observation comes from the Multicentre Selective Lymphadenectomy Trial (MSLT-I).[1] The MSLT-1 was a large, international, multi-centre randomised controlled trial. At 10 years the study showed no significant reduction in melanoma specific, or all-cause mortality after SLNB, in the entire cohort of intermediate thickness melanoma patients (Hazard Ratio (HR) =0.84; 95% CI, 0.64 to 1.09; P = 0.18).[1] This could be because only approximately 20% of patients (those with a positive sentinel node) could ever gain a benefit from surgery and in a subgroup analysis, a significant melanoma-specific survival was shown in this group (HR 0.67; 95% CI, 0.46 to 0.97; P = 0.04).[1] In addition to this, the MSLT-I showed that compared with delayed dissection after observation; therapeutic lymph node dissection after SLNB is significantly associated with a longer disease free survival.[1] The study showed that in these circumstances the recurrence at the regional basin reduced from 20-50% (Obs.) to 2-10% (SLNB) (HR=0.76; 95% CI, 0.62 to 0.94; P = 0.01).[5] Interpreted at face value, these data would prove an advantage in quality of life through disease free survival for SLNB patients. Disease free-survival is a significant outcome in melanoma, with another study showing that patients felt time spent with recurrence to be worth only 63% of time spent disease-free.[13] The same study also showed that disease free survival significantly benefitted patients from an emotional, physical and quality-of-life perspective.[13]

LIMITATIONS

One criticism of these data is that the longer disease free survival after SLNB may occur because the nodes in which you would expect to find clinical disease recurrence have been removed, causing a lead-time bias.[14] Additionally it may be that because nodes containing melanoma found with SLNB are not classified as diseased, whereas any positive nodes found in clinical observation are, there may be an artifactual increase in disease free survival in SLNB.[15] Critics also believe the subgroup survival analysis showing significant melanoma-specific survival in patients with a positive SLNB to be inherently flawed because it assumes all these nodes will become clinical nodal metastases. There is evidence to show this is not the case, and that many of these tumour cells will be "destroyed by the body's immune system in the harsh environment of the lymphatic system, making these false positive diagnoses".[14] These 'false positives' would bias MSLT-I towards intervention and lead to inaccurate increases in disease stage, unnecessary operations and adjuvant therapy regimes for patients.[15]

Further to this, it has been suggested that of the 20% of patients undergoing biopsy with a positive sentinel node, only 20% will have metastatic disease in non-sentinel nodes. This means that 16% of patients undergoing sentinel node investigation will have unnecessary therapeutic lymphadenectomy.[14] This is a procedure associated with significant morbidity, which has led to a decline in the patient uptake of this operation.[5] Despite these criticisms, the MSLT-I has shown conclusively that SLNB is a more accurate prognostic factor than standard demographic and histopathological factors.[1] This means that if the procedure is undertaken, patients can be given the most accurate information regarding their likely disease outcomes, something that is likely to be worth the risk of significant morbidity to some patients.

Metastatic disease in the sentinel node can also be significant to patients psychosocially, because nodal disease is a bad prognostic indicator in a disease that causes 80% of skin cancer related deaths.[10] Learning this news is devastating for patients and their families, but having a clear prognostic view can allow for better advance care planning.[2] The information gained in SLNB can therefore not only imbue patients a greater disease free survival, but a greater quality of life in their last months and years. This advantage comes from giving patients the knowledge they require to come to terms with their disease, put their affairs in order, and interact with palliative care at an earlier stage. While patients often fear palliative care and believe accepting it means nothing more can be done for them, the opposite is actually true. Studies show palliative care not only improves quality-of-life outcomes but also carries a substantial survival advantage if introduced at an early stage.[16] The prognostic accuracy of SLNB could thus allow patients

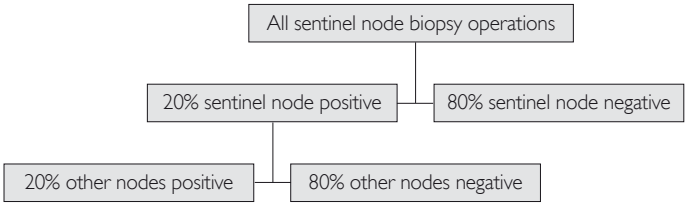

Figure 1: Epidemiologic results of sentinel lymph node biopsy in melanoma

to access this survival benefit, and have less aggressive care at the end of their lives.

To access the benefits of SLNB, patients must undergo surgery, which is not without complications. According to one study, the rate of complications in SLNB is 4.6%, with the most common issues being local haematoma, seroma or wound infection.[3] These complications are usually without long-term consequences.[3] More serious complications include nerve damage and lymphedema, the rate of which is 0.6-1%, however the absolute risk of these varies widely depending on the site of the sentinel node.[3,5] The rate of total complications and lymphedema are significantly higher in therapeutic lymph node dissection, at rates of 23.2% and 11.7% respectively; however patients will have to tolerate these risks if nodal disease is found on SLNB or clinical observation.[3] Further to this, MSLT I showed patients who had a positive SLNB specimen and underwent therapeutic lymphadenectomy had a lower incidence of lymphedema and a shorter hospital stay than those who underwent delayed lymphadenectomy for clinical nodal recurrence.[17] In summary, the rates of physical complication in SLNB are low, and the consequences usually transient. Lymphedema is a dreaded complication, but the risk is low, and outcomes in therapeutic dissection are better after SLNB. Given the context of melanoma the potential benefits of the information gained outweighs these physical risks.

Surgeons strive to reduce physical complications in surgery, however often more distressing to their patients are the psychological complications. There is one retrospective outcome study looking at such complications after SLNB in melanoma. This study reported the most common psychological complication to be concern about the histology result during the postoperative waiting period, which occurred in 85% of participants.[2] Postoperative anxiety, in 9% of patients, was the next most common psychological complication. Despite these concerns, 97% of patients felt glad they had the procedure and 98% would recommend it to other patients.[2] Patients also reported the procedure made them feel reassured and well looked after, with specific advantages being peace of mind, improved family life, and the ability to plan for the future.[2] These advantages were realised independent of the biopsy outcome.[2] Overall, this study proved that patients feel the advantages of SLNB outweigh its psychological complications and feel comforted by the information it provides, even if the biopsy comes back positive.

CONCLUSION

Current evidence would suggest SLNB does not improve melanoma-specific or all-cause survival in intermediate thickness melanoma. However, these are not the only important factors to patients, and there is proof that the procedure may improve disease free survival, which factitious or not, improves patient quality of life. In addition to this, SLNB provides the most accurate prognostic information available, and as discussed there are numerous patient-centred advantages to this, including eligibility for adjuvant therapies. Physically, the risk of complications is low in SLNB, and psychologically the procedure is more likely to relieve patient distress than create it. So, weighing the quality of life improvements gained from prognostic information against the physical and psychological risks of the procedure, it is apparent that the information gained is well worth the risks. Hence, while SLNB is not a procedure without controversy, it is still a worthwhile one and something that should continue to be discussed with patients.

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Sentinel node biopsy in malignant melanoma: is the information worth the risk?

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ABSTRACT

Malignant melanoma has a high incidence in New Zealand and Australia. Melanoma primarily spreads via the lymphatic system, and nodal metastases are an important prognostic marker. The sentinel lymph node is the first draining node in a lymphatic basin downstream of a tumour. The use of sentinel node biopsy in malignant melanoma remains controversial, with the purported benefits being widely debated. Sentinel node biopsy offers useful prognostic information in patients with 1-4mm thickness melanoma, though no therapeutic benefits have been shown when used in conjunction with completion lymph node dissection. There are few physical risks of sentinel node biopsy, which has a low complication rate. There is spare evidence addressing the psychological impacts of sentinel node biopsy, though it appears to confer some short-term benefits. Patient preferences and clinical judgement are important considerations. Sentinel node biopsy may only be useful as a prognostic indicator in patients with 1-4mm thickness melanoma. No therapeutic benefits have been shown to date. As new evidence emerges, the role of sentinel node biopsy should be reconsidered accordingly.

BACKGROUND

Malignant melanoma (MM) is increasing in incidence globally, with high rates in New Zealand and Australia.[1, 2] Although melanoma causes 75% of skin cancer-related deaths, its optimal management remains unclear.[3, 4] MM is defined as a malignant clonal expansion of melanocytes, originating in the dermis. Like many cancers, it primarily spreads via the lymphatic system, and nodal involvement is present in 20% of patients with intermediate thickness (1-4mm) melanoma.[5] Nodal metastases are an important prognostic marker in MM, and it has been hypothesised lymph node clearance may improve prognosis for patients with nodal metastases.[5] When nodal metastases are clinically palpable, the decision to proceed with lymphadenectomy is straightforward.[6] However, trials have shown routine lymphadenectomy confers no survival benefit for patients with intermediate-thickness melanoma but without palpable metastases.[7]

The sentinel lymph node is defined as the first draining node in a lymphatic basin downstream of a tumour, and can be identified intraoperatively using lymphoscintigraphy with radioisotope and blue dye.[5, 8] Sentinel node biopsy (SNB) has been suggested as a means of identifying patients with micrometastases who may benefit from lymphadenectomy.[8] Completion lymph node dissection (CLND) is then performed only if the sentinel node contains metastases.

The benefits of SNB remain controversial, despite its rapid uptake in clinical practice and guidelines. This review aims to summarise and review the current evidence addressing whether the information gained from SNB in patients with MM is worth the associated physical and psychological risks.

INFORMATION GAINED FROM SENTINEL NODE BIOPSY

The therapeutic benefits of SNB are widely debated, though its role in detecting micrometastases as a prognostic factor in MM is well established. Primary melanoma lesions can be classified as thin (≤1mm), intermediate (1-4mm), or thick (>4mm), with a progressively worsening prognosis in each group.[9] The benefits of SNB differ in each group, corresponding to an increasing risk of nodal and distant metastasis.

For melanomas >1mm thickness, sentinel lymph node status has been identified as the most important independent predictor of overall survival.[10, 11] Therefore, identification of Stage I/II (node-negative) or Stage III (node-positive) disease is an important process and may guide further surgical or adjuvant treatment.

A recent systematic review showed SNB has a false negative rate of 12.5% overall (95% CI 11%-14.2%) for the detection of micrometastases.[12] Furthermore, the post-test probability negative (proportion of patients with a negative SNB who develop nodal metastases), was calculated as 3.4% (95% CI 3.0%-3.8%).[12] Some authors have raised concerns about the prognostic false positivity rate of SNB, wherein micrometastases are detected in patients who will not progress to develop clinically significant recurrence. Data from MSLT-I, a large randomised trial, showed as many as 34% of patients with a positive SNB who consequently underwent CLND would not have developed clinical recurrence at a 5-year follow up.[13] This represents a common clinical dilemma, wherein predicting the risk of recurrence in any individual patient is a difficult task.

Thin lesions represent nearly 70% of all melanomas, and are unlikely to exhibit metastatic spread.[14] Meta-analyses have shown a pooled SNB

positivity rate of 5.6% for patients with thin melanomas, and therefore SNB provides limited information for these patients.[14, 15] Given a low pre-test probability of metastasis and a known false-negativity rate of SNB, it is unlikely SNB will reliably provide valuable prognostic information for patients with thin melanomas.

Patients with intermediate thickness melanomas have been hypothesised to have the most benefit from SNB, as they are unlikely to have distant spread, but may have nodal metastasis. Key prognostic factors for patients with intermediate and thick melanoma include nodal spread, Breslow depth and ulceration of the primary tumour; in order of decreasing hazard ratio.[16] A recent pooled analysis of 19 studies showed melanomas with a positive SNB have a 0%-47.8% risk of melanoma-related death at a 4 year follow up, compared with 0%-11.9% for those with a negative SNB.[15]

Thick melanomas are most likely to have distant metastases, and have the poorest prognosis. It has been suggested SNB may be less useful in determining prognosis in thick melanomas, given their propensity to have already metastasised to nodes and distant organs at the time of presentation.[17] Few studies have investigated thick melanomas specifically, and the prognostic value of a positive SNB has not been consistently shown in this population.[15, 18, 19]

SNB therefore offers valuable prognostic information for patients with 1-4mm thickness melanoma. If such a patient is identified as Stage III by SNB, that represents a significantly different prognosis, which may be of value for patients and clinicians when considering adjuvant treatment options, ongoing management and follow up.

THERAPEUTIC BENEFITS OF SENTINEL NODE BIOPSY

A Cochrane review from 2015 identified MSLT-I as the only randomised trial to date comparing SNB +/- immediate CLND vs. SNB and nodal observation in melanoma patients.[20-22] A 10 year follow up of this trial showed SNB +/- CLND improved disease-free survival for patients with intermediate (HR 0.76, 95% CI 0.62-0.94) and thick (HR 0.70, 95% CI 0.50-0.96) melanomas, but there was no significant difference in melanoma-specific survival between the two groups.[21] The authors have reported other sub-group analyses, but these have been widely debated and are not statistically appropriate.[23, 24] Furthermore, several retrospective studies have shown similar results to MSLT-I, supporting the conclusion that SNB has no impact on overall survival for these patients.[25-29]

Approximately 80% of patients with a positive sentinel node have no further nodal metastases.[17] Therefore SNB alone is hypothesised to provide both diagnostic and therapeutic benefits. A second randomised trial, MSLT-II, began in 2005 and is currently investigating whether all patients with a positive SNB require CLND.17 N-SNORE, a validated prognostic score, may predict the presence of positive non-sentinel nodes in patients with a positive SNB, and determine which patients may benefit from CLND.[30, 31] Until MSLT-II is completed, CLND may be discussed with patients undergoing SNB, though no clear evidence of a survival benefit exists.[21, 26, 29]

PHYSICAL RISKS OF SENTINEL NODE BIOPSY

SNB is safe, with a complication rate of 5-10%.[11, 32] Most adverse events are haematomas, seromas or wound infections, and resolve with minimal intervention. It is important to note radiolabelled colloid or dye is contraindicated in pregnant women and those with hypersensitivity.[33] Anaesthetic-related risks are also relevant when selecting surgical candidates.

Wide local excision (WLE) with SNB may have equivalent complication rates to WLE alone, and therefore SNB may not confer additional morbidity to patients not requiring CLND.[11] In contrast, CLND has a complication rate of up to 37%.[11, 32, 34] Rates of infection, haematoma, seroma and nerve injury are all significantly greater following CLND. Furthermore, lymphoedema affects 10-30% of patients and significantly diminishes quality of life.[32, 34, 35]

Appropriate use of SNB may spare patients without nodal disease from the morbidity associated with routine CLND. However, the known prognostic false positivity rate of SNB may over-diagnose metastasis in some patients, leading to additional morbidity from CLND.[13] Furthermore, patients who undergo early CLND following detection of micrometastases have been shown to have a lower lymphoedema rate when compared with CLND for clinically recurrent disease.[36] SNB is therefore a safe, low-risk procedure, which may spare selected patients from the morbidity associated with either routine or delayed CLND.

PSYCHOLOGICAL RISKS AND BENEFITS OF SENTINEL NODE BIOPSY

Ryatt et al. showed short-term psychosocial benefits of SNB, independent of the biopsy result.[37] The majority of patients (91%) believed they gained some benefit from SNB, and peace of mind was cited as the main advantage by 85%.[37] SNB was perceived positively; almost all patients (97%) were glad they had the procedure, and 98% would recommend it to others.[37] Furthermore, recurrent melanoma has been shown to increase tension, fatigue and confusion, and reduce vigour.[38] This suggests SNB +/- CLND as a means of preventing recurrence may improve long-term quality of life and well-being.

Limited evidence suggests psychosocial factors may influence outcomes in a number of cancers. Patients in denial about their breast cancer diagnosis and those who adopted a fighting spirit had improved 5-year survival than those who stoically accepted their diagnosis, or adopted a hopeless outlook.[39] Furthermore, 'Type-C' individuals, characterised by being cooperative, unassertive, patient, and compliant with external pressures, have a poor prognosis in melanoma.[40] The inverse appears to be true; in MSLT-I, patients with more vigour at baseline had longer disease-free and overall survival after adjusting for age, tumour thickness, site and ulceration status.[38]

Psychological factors and individual preferences are highly variable, and it is important to discuss with patients whether they want to know their prognosis precisely. Over-anxious, psychotic or unstable patients may need considerable counselling before comprehending the reasons for performing SNB, and may have a poorer prognosis independent of their SNB result.

DISCUSSION

Clinical judgement is paramount when considering the decision to proceed with SNB. The risks and benefits of SNB, with or without CLND, should be weighed against potential prognostic information, psychological benefits, and a modest improvement in disease-free survival if CLND is performed following a positive SNB. The tumour location and subsequent lymphatic drainage also contributes to the risk-benefit profile. Each patient's comorbidities should be considered, including the operative and anaesthetic risks, plus other potential causes of morbidity and mortality. If another disease process is advanced and more likely to contribute to mortality than melanoma, there is little utility in accurately staging metastatic disease. Discussion of SNB and the associated risks and benefits should be considered standard of care for all patients with >1mm thickness melanoma. Ultimately the physician's role in this setting is to present and explain the available options and allow the patient to make an informed decision.

The economic cost of SNB has been variably reported as this differs between individual centres and health systems. The US Medicare reimbursement rate for SNB has been reported as up to US$19,000 per patient, with 80% of these patients having negative nodes.[41] British studies report additional costs related to SNB as £1420, though there is little data from a New Zealand setting.[15, 42] The demands of routine SNB in a public health system with constrained resources need to be considered. Economic and health-system factors are likely to influence any local or national policy regarding SNB.

There are many areas for future research in this area, including determining accurate predictors of which patients may benefit most from SNB, by identifying patients at highest risk of nodal metastasis or recurrence. The impacts of SNB on quality of life (QoL) remain poorly investigated, and

warrant further attention. Ultrasound surveillance of nodal basins appears a promising alternative to SNB, and may be increasingly utilised in the future.[13] Furthermore, emerging evidence suggests tumour lymphangiogenesis may be a predictor of sentinel node status and an alternative or adjunct to SNB.[43, 44]

CONCLUSION

Despite considerable debate, SNB is a safe and effective means of detecting nodal metastasis in patients with MM. It has been shown to prolong disease-free survival in patients with intermediate and thick melanoma when used in conjunction with CLND, but no mortality benefit has been demonstrated, and concerns have been raised regarding prognostic false positivity. The psychosocial effects of SNB have not been fully elucidated, and its effect on QoL in the short- and long-term remains unknown. SNB is useful as a diagnostic and prognostic tool for selected patients, but has minimal therapeutic benefits. Discussion of SNB should be standard of care for all patients with 1-4mm thickness melanoma. Ultimately, the decision to proceed with SNB should be guided by patient preferences regarding how accurately they want to know their prognosis, whether they are prepared to proceed with CLND, and the constraints of a public health system. This decision should be continually re-evaluated as new evidence emerges regarding SNB and other novel techniques for the management of melanoma.

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Group A streptococcal meningitis: a case report and brief review

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ABSTRACT

Invasive Group A streptococcus (GAS) disease is an important cause of morbidity and mortality, and its incidence has been on the increase in industralised countries since the mid-1980s. Meningitis is an especially rare manifestation. We report one such case in a previously healthy 44-year old woman, followed by a brief review the epidemiology, pathogenesis, presentation, complications, and management of GAS meningitis within a New Zealand (NZ) context.

INTRODUCTION

Invasive Group A streptococcus (GAS) disease causes significant morbidity and mortality.[1] Meningitis is an especially rare manifestation of invasive GAS disease. We report one such case in a previously healthy woman and briefly review the literature on the topic.

CASE REPORT

A 44-year old female café worker from a rural area presented to our hospital with a 4-day history of generalised myalgia, headache and increasing lower back pain, and a 2-day history of fever and nausea. She denied rash, photophobia, recent ill contact, or animal contact, and divulged a travel history to Vanuatu two months ago. There was no significant past medical history or any regular medication.

On examination, she was restless, but afebrile and haemodynamically stable. There was mild pain on neck flexion but no nuchal rigidity, and no focal neurology. Detailed systemic examination was otherwise unremarkable, including normal otoscopy and throat examination.

Initial blood tests showed leukocytosis (14.4x109/L[Normal range 4-11x109/L]) and elevated C-reactive protein (237.2 mg/L[Normal range <6 mg/L]). Electrolytes, liver enzymes, renal function, and urinalysis were normal. Intravenous ceftriaxone 2g once daily was commenced empirically as well as to cover possible leptospirosis, which is prevalent in the Waikato in a NZ context.[30]

Overnight, the patient developed saddle anaesthesia but with preserved anal tone, as well as ataxia, and neck stiffness. Examination revealed subjective numbness in the soles of her feet, but a preserved spinothalamic sensory pathway. Whole spine and brain magnetic resonance imaging (MRI) was non-revelatory, apart from a mild, non-specific epidural fluid isointensity extending from T10 to L5. Specialist radiology and neurology opinion was sought, but these changes were thought to not be in keeping with an abscess, and likely represented non-specific meningeal reaction. Lumbar puncture following the scan revealed straw-coloured cerebrospinal fluid (CSF) consistent with bacterial meningitis on analysis, showing leukocytosis (176x109/L, 90% neutrophils), low glucose (<0.1 mmol/L [Normal range 2.8-4.4 mmol/L]) and elevated protein (4.6 g/L[Normal range 0.15-0.45 g/L]). Blood cultures taken on admission later grew GAS in both aerobic and anaerobic bottles, predictably sensitive to penicillin. Viral culture was negative, as was a leptospira panel.

The initial management with intravenous ceftriaxone was continued due to clinical response. Dosage was increased to twice daily for the next five, before being stepped down to a once daily regime to complete a 14-day course. The patient became mildly hyponatraemic later in the course of the admission (127 mmol/L, [Normal range 135-145 mmol/L]) attributed to inappropriate secretion of anti-diuretic hormone. Saddle anaesthesia persisted on discharge on day 14, but there were no other neurological or medical sequelae. A repeat whole spine MRI towards the end of admission was reassuring, with no further progress of the lumbar area signal change. The patient reported no change in saddle anaesthesia at follow up via phone consult a few months later.

DISCUSSION

Epidemiology

GAS, or Streptococcus pyogenes, is responsible for a variety of clinical syndromes, ranging from mild infection of the skin and upper respiratory tract, to severe disease such as toxic shock syndrome and necrotising fasciitis. Rheumatic fever is an important cause of S. pyogenes-related cardiac morbidity in NZ. Rarely, the inoculation of GAS into a sterile site in the body can lead to invasive disease, more commonly of soft tissue. Invasive GAS disease is associated with a high mortality rate.[1] Although GAS was a common cause of meningitis up to the early 20th century, it is now one of the least frequently reported forms of invasive GAS disease.[2-4] This shift coincided with the sharp decline in the general incidence of invasive GAS disease seen globally in the mid-20th century, variously attributed to the advent of modern antibiotics, the prevalence of less virulent strains, and improved living conditions.[1,4,5]

The past three decades, however, have witnessed a gradual reversal of this trend. A resurgence of invasive GAS disease has been reported in many industrialised countries, with an estimated annual rate comparable to that of invasive meningococcal disease at 4 to 6 per 100,000.1 NZ data from a recent Auckland study suggest a higher incidence at 8.1 per 100000 per annum in the general population.[6]

Meningitis has been estimated to occur 1-3% of cases of invasive GAS disease in two separate national surveillance studies from Denmark and Canada.[7,8] However, GAS has been implicated in less than 1% of all bacterial meningitis in two separate national-level prospective studies in the United States and the Netherlands across two decades.[9,10] Given its rarity, data on GAS meningitis have predominantly been based on analyses of individual case reports and series, primarily affecting children.[3,11-13]

Strain virulence

The M protein is an important feature of GAS virulence in human hosts, and is coded in the bacterial genome by the emm gene.[5] The M1T1 serotype has been implicated most consistently and in the majority of invasive GAS disease outbreaks internationally, including in NZ,[6,14] but other serotypes have also been reported.[15,16]

Subsequent typing analysis of our patient's GAS isolate by the Institute of Environmental Science and Research (ESR, Porirua, NZ) revealed it to be of the emm106 type, a rarely-reported strain first classified in 2002 following a bacteraemia case in Malaysia.[17] This emm type has previously been isolated from invasive GAS disease in NZ, albeit remaining an uncommon strain.[6] One Taiwanese study, however, reported a high prevalence of the emm106 type isolated from invasive disease in the elderly, whilst a further study from Taiwan found it to be significantly associated with a higher risk of invasive soft tissue disease compared to other emm types.[18,19] The emm106 was also found to be a common strain for invasive disease in a New Caledonian study.[20] Although it is difficult to extrapolate this data to the rest of the Melanesian sub-region, it is of some interest that our patient had traveled to neighbouring Vanuatu two months prior to her presentation.

Pathophysiology

Whilst haematogenous spread from the pharynx to the CNS is well-established in meningococcal meningitis, the pathogenesis of meningitis as caused by GAS, also a common pharyngeal commensal, is less well understood.[3,12] Reported predisposing factors for GAS meningitis include a focus of infection (especially otolaryngological), meningeal breach (such as basal skull fracture or neurosurgery), compromised immunity, and young age.[3,11,12,21] A systematic review in 1999 reported that a little less than two thirds of reported cases presented with predisposing factors.[11] As with our patient, GAS meningitis has also been reported in previously healthy adults.[22]

Presentation and management

Although our patient did not initially present with meningism, fever, or rash, this is not unusual for bacterial meningitis.[23] A large Dutch prospective study noted that fewer than half of patients with bacterial meningitis presented with a triad of neck stiffness, headache, and change in mental state, and only approximately one quarter presented with new rash.[9] There are no clinical features reported to distinguish meningitis as caused by GAS from typical organisms.[3,9,11] This highlights the importance of vigilance amongst clinicians in patients who present with non-specific symptoms. Penicillin is the antibiotic of choice in invasive GAS disease.[1]

In NZ, surveillance data by ESR suggest a minute percentage of GAS resistance to penicillin in 1998 (0.1%) and 1999 (0.2%), but this pattern has since virtually disappeared, including in the most recent report in 2011.[27] Erythromycin-resistance was relatively stable at 0.9% to 1.5% of GAS isolates between 1998 and 2005, but this rose to 6.4% in 2011.28 Tetracycline-resistance was 12.5% in 2001, with no clustering by source (hospital or community) or geographical location found.[29]

Course and complications

The course of GAS meningitis can be fulminant and severe, especially for children. Complications include seizures, coma, and focal neurological deficit.[3,11] The mortality rate for GAS meningitis is comparable to that of meningococcal and Haemophilus influenzae B meningitides, but post-meningeal sequelae may be higher.[11]

In a Dutch case series on GAS meningitis, hyponatraemia was observed in more than half of the 41 patients studied, a feature more often recognised with tuberculous and Staphylococcus aureus infection.[12] Hyponatraemia has also been reported elsewhere in the literature as a complication of GAS meningitis.[24,25] However, whether this is a consistent and clinically significant aspect of GAS meningitis is yet to be established.

GAS meningitis has previously been reported in NZ in the context of puerperal sepsis (one patient) and toxic shock syndrome (five patients).[6,26] To our knowledge, however, this patient is the first reported case in a previously healthy adult in NZ, and the first ever report of sacral radiculopathy complicating GAS meningitis. The initial presentation with severe lower back pain and subsequent finding of in lumbar spine MRI may explain the symptoms that evolved.

CONCLUSION

We have reported a case of GAS meningitis with no discernible predisposing factors, an atypical presentation and radiological evolution culminating in an overall positive outcome. The literature, however, highlights the significant morbidity and mortality associated with this disease in the majority of cases. We believe that the increasing incidence of invasive GAS disease in its multitude of forms is of more than just academic interest and remains an important public health issue internationally that NZ clinicians need to be aware of.

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Yes, no, maybe — are traffic lights the signal for healthy food choices?

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ABSTRACT

In New Zealand there are a number of arguments for the introduction of a traffic light labelling system (TLS) on packaged foodstuffs.[1] If the legislative changes required for the introduction of this type of system were to go ahead, the benefits could be wide-ranging and impact the population as a whole, as well as individuals.[1] This viewpoint will explore the arguments for the introduction of a TLS, as well as acknowledge some of the arguments against this change, and outline several of the potential challenges faced.

BACKGROUND

New Zealand's Ministry of Health states that "in 2012 New Zealand adults ranked third highest out of 15 OECD countries for measures of obesity".[2] While "in 2010 New Zealand children (aged 5–17 years) ranked third highest out of 40 countries for overweight (including obesity)".[2] When the impact of these statistics is considered, the results are truly concerning.[3] Lal et al. suggests that in 2006 the health care costs that were attributable to an overweight population and obesity were estimated to be NZ$624m.[3] Some of these costs are attributable to the increased risk of developing chronic diseases as a result of being overweight or obese.[3] The costs lost due to decreased productivity, primarily caused by the increased morbidity and mortality associated with diseases with a causal relationship to obesity, are significant. In 2006 these were estimated to be between NZ$98m and NZ$225m.[3]

In addition, the prevalence of obesity among Māori and Pacific Island communities was much higher compared to other ethnic groups.[1-3] This difference is especially demonstrated with Māori and Pacific infants.[4,5] There is also a gradient demonstrated in socioeconomic status, with those living in the most deprived areas four times more likely to be extremely obese, compared to those living in the least deprived areas.[2]

As the rates of overweight and obesity continue to dramatically increase[6], they will have a widespread impact on the population, and a considerable effect on individuals. It is becoming increasingly important to take action on a population-wide scale.[3] The World Health Organisation (WHO) has highlighted this need for action.[7] Specifically, WHO has noted the trend of an increasing burden of non-communicable diseases, and the largely modifiable risk factors associated with these.[7] WHO also notes the increasing trend of the development of Type Two Diabetes Mellitus in younger age-groups. WHO suggests that changes to policy may be one strategy to achieving this – "to encourage the development, strengthening and implementation of global, regional, national and community policies and action plans to improve diets and increase physical activity".[7]

A TLS has been suggested as one tool to help in changing these trends.[1] White and Signal define a TLS as "a system using green, amber and red symbols to indicate the extent to which a food should form part of a healthy diet".[1] Generally, these colours are accompanied by relevant words such as low, medium, and high (e.g. levels of fat), and are placed on the front of packaged foods.[1] In 2014, the National Government in New Zealand introduced a voluntary, star-based food labelling system, alongside Australia.[8] This system has some significant differences to a TLS, and some researchers suggest it will be much less effective.[9]

A TLS offers more information, which consumers can use to discriminate between products.[9] Typically four variables are rated using the TLS, whereas the star-rating typically provides only one overall star rating.[9] A star-based food labelling system tends to frame only positive information within front of package labelling, unlike a TLS.[9] Maubech et al.'s research demonstrated that a TLS was considerably more effective (than other systems, such as the star-based food rating system, or Daily Intake Guide) at impacting consumer choices when unhealthy food options were offered.[9] A TLS was demonstrated to be more effective at reducing the impact on consumer choice of persuasive package marketing and advertising, for example, a health claim.[9]

DISCUSSION

First and foremost, a TLS provides a simple tool with a wide scope of use.[10] People who have limited literacy or numeracy skills (who may not be able to analyse the nutritional chart on the back of a package) can use it with relative ease to assess how healthy a particular food is.[11]

There is a considerable volume of evidence that demonstrates TLS can help people make healthier food choices.[1] Of specific relevance in the New Zealand context, this kind of labelling system is particularly useful in helping to influence the decisions of people from a low socioeconomic background, and those of Māori and Pacific ethnicity, although the authors do not hypothesise as to the possible reasons for this.[1] This is of particular importance as Māori and Pacific are at increased risk of developing obesity and diet-related diseases, such as Type Two Diabetes Mellitus.[1]

Fifteen of the twenty-two articles included within White and Signal's analysis indicated support for the introduction a TLS, while four articles were not considered supportive.[1] A number of the studies demonstrated study participants were "better able to identify healthier food options using traffic light labelling than when using other systems".[1] From their 2012 study, Mclean, Hoek and Hedderley concluded that a TLS could still help people to make healthier decisions, even when products displayed nutritional claims.[11] In conjunction with this argument White and Signal suggest the introduction of a compulsory TLS could lead to a self-fulfilling prophecy, whereby food manufacturers are encouraged to change their processes, as well as consider reformulating their products, in order to obtain a healthier TLS label and therefore reinforcing the benefits of the introduction of a TLS.[1]

Developing on from the idea that a TLS can help many individuals to make healthier eating choices, the widespread use of a TLS could result in significant changes for the health of the population as a whole. The Australian model formulated by Sacks et al. suggested a TLS could result in a reduction of weight per person of 1.3 kg on average, and save 45,100 Disability-adjusted life years (DALYs).[12] However, the authors demonstrated that other policy interventions such as a "junk food" tax could also be effective.[12] The implementation of a TLS could have a significant long-term impact as children are encouraged to learn to make healthier choices, therefore improving the health of the population further over time.[13]

As well as bringing improvements in health for the population, there is also a strong argument that the introduction of a TLS will have economic benefits. The cost savings obtained from a TLS, by and large, out-weigh the costs of introduction.[12] For example, in Sacks et al.'s model there was a cost saving of AUD$455m to the economy.[12] However, there are certainly gaps in this data. For example, the Australian Assessing Cost-Effectiveness (ACE) in Obesity study did not complete a cost-effectiveness analysis on a TLS, as the researchers considered there was a lack of demonstrated effectiveness.[14] Also, Mernagh, Paech, and Weston's report prepared for the Health Research Council of New Zealand did not include a TLS for comparison in their evaluation.[15] Some of the alternative strategies evaluated for cost effectiveness included General Health Screening, Green Prescription, School Nutrition Policy Initiative (SNPI) and Switch-Play, of which Switch-Play, an initiative focused on encouraging physical activity within a school setting, was found to be most cost effective.[15]

As a result of the significant amount of research completed in this area, numerous bodies have voiced their support for a TLS system. In their 2014 policy document "Tackling Obesity" one of the ten recommendations the New Zealand Medical Association made is the introduction of a TLS system.[13] The Royal Australian College of Physicians has an established policy statement recommending the implementation of a TLS.[16] The Auckland-based Clinical Trials Research Unit published a position statement supporting the use of a front of package TLS.[17] New Zealand's Food Regulation Ministerial Forum's 2011 report supported the introduction of a TLS.[1] In the US in 2010 the White House Childhood Obesity Task Force "identified the need to improve front-of-package nutrition labels".[18] In the UK, a TLS system has already been introduced for particular packaged foods.[19]

One of the important arguments against the use of a TLS is that it can be seen as a paternalistic policy which reduces people's ability to make decisions of their own accord.[20] Traditionally, food choices have been seen as within the domain of personal responsibility.[21] Tony Blair, the former British prime-minister, stated, when commenting on obesity, "our public health problems are not, strictly speaking, public health questions at all. They are questions of individual lifestyle".[21] However, Magnusson goes on to counter this argument and state that personal responsibility and motivation alone are unlikely to be useful in bringing widespread population level improvements in health, and population health approaches which alter the environment in which individuals make choices are required.[21]

White and Signal's analysis largely suggested that a TLS was better able to help consumers identify healthier food options, compared with other systems, such as a Daily Intake Guide System (introduced by the food manufacturing industry) or Guideline Daily Amount system.[1] Roberto et al. agreed.[18] In addition, a 2010 Australian study suggested there were significant benefits over alternative strategies directly targeting individual diet and exercise behaviours.[12] However, there was not an absolute consensus in White and Signal's analysis, and the authors could not conclude that a TLS system was more effective than all possible systems for this purpose.[1] In New Zealand, the introduction of the voluntary star-based system in 2014[8], reduces the likelihood of the government and industry agreeing to introduce a TLS. However, some researchers suggest that further research could validate a traffic-light coloured star-based system.[9]

A significant challenge of implementation is the opposition from the vast majority of food manufacturers. White and Signal suggest that support from the food manufacturing industry would be vital in further research, pilot studies, or the implementation of a TLS.[1] The majority of stakeholders in the food industry are strongly opposed to the introduction of a TLS[21], maintaining this position despite the introduction of the voluntary star-based system. Their reasons for opposition are primarily focused on the potential loss of revenue, secondary to an encouraged change in dietary habits and therefore possible changes in the pattern of purchasing.[21]

Another challenge in the introduction of a TLS is how to ensure that there is adequate consumer awareness that such a system exists and how best to use it.[22] In their 2014 study on food choices, in a fast food context, Dodds et al., found that a TLS alone, without appropriate consumer engagement had no impact in reducing the energy intake from their hypothetical menu.[22] Therefore, the authors suggested that it was necessary to ensure that a TLS was introduced in a way which increases consumer awareness of, and support for, the new change in labelling.[22]

CONCLUSION

In conclusion, although there are significant challenges to overcome, traffic light foodstuff labelling has many potential benefits to offer to the New Zealand population, over and above, star-based labelling.[1] Although academics in the relevant fields are largely in agreement that traffic light labelling should be implemented, these policies would need to garner further support from the government. In addition, to gain traction, there would need to be significant changes in the position of the majority of stakeholders in the food manufacturing industry.[1] However, with increased public awareness, and continued lobbying, there is still potential for this important public health initiative to come to fruition.

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Indonesia baby

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When I arrived back from my fifth year selective on a remote island in Indonesia, I didn't want to sleep in my bed. It felt too soft after four weeks of sleeping on a concrete floor.

I went to Indonesia because I suspected deep in myself a lack of awareness. In mental health, we say that a person with 'limited insight' realise to some degree they are unwell or need help, but at the same time cannot recognise fully that they have a mental illness. I think many of us walk around with limited insight when it comes to the injustices of the world. It's pretty difficult to function otherwise. My selective was a sudden, horrific exposure to some harsh truths: truths we mostly manage to block out of the realities of our daily lives.

This essay is a collection of my thoughts and reflections on an experience that has profoundly shaped me as an individual and a doctor. For a long time after my trip, I found it difficult to even put into words what I had seen. This is an attempt to explain.

THE BABY WHO DIDN'T LIVE

About two weeks into our trip, we arrived in a village to find a ten month old baby named Chelsea dying of cerebral malaria. She fitted almost continually while I ran to the one spot on the top of a hill where there was cellphone reception. I called my mum, which felt ludicrous. We were three medical students, left alone on an island where English was spoken by very few. There was a storm so we couldn't leave the island. I was calling my mum to ask her to talk to a paediatrician friend about how long it would take for this baby to die without water.

"ICU, intubation, brain damage" was all the paediatrician said. I wanted to know how to tell if she was in pain, and how to get her to swallow again. It suddenly seemed almost comically unfair. How could this baby, beautiful and deeply loved, be left to die on the floor of a wooden hut?

Since my trip, I have become very interested in the impact of Western medicine on the diverse societies it professes to serve. What did three Kiwi girls armed with an Oxford Tropical Medicine textbook, some expired medications and shiny new stethoscopes add to the death of an Indonesian baby on Nias Island? What did we take away?

The answers to these questions are frustratingly complex. I would like to share with you some of my thoughts on the potential harms of a paternalistic 'white saviour syndrome' approach, the development of systems to enable health, and the best use of limited resources in developing countries.

"AT LEAST WE'RE HELPING..."

One of the thoughts that kept coming back to me was the phrase 'at least we're helping…' We did help certain individuals in various ways – for example pulling teeth to relieve pain, using antibiotics to treat a serious foot infection, and catheterising a woman in urinary retention who thought she was about to die. However, many of the things we did probably didn't make a lot of difference, and may have in fact been harmful.

"ACTUALLY WE MIGHT BE HARMING..."

I started to consider more deeply the damages that a Western doctor might unwittingly inflict upon an isolated community. By emphasising curative efforts and medication, I saw limited resources directed away from areas such as women's literacy and child nutrition. Even well-intended procedures can leave patients with complications that they do not have the resources to deal with. I worried about minor skin operations that we performed, as after we left the island no one was there to monitor for infection or remove sutures. Another perhaps less tangible effect was the way in which we fostered a perception among the islanders we met of Western medicine being magic. It seemed to me that many of the islanders concurrently believed in medical science, in magic men, and in God.

Mothers often believed that malaria was caused by the wind getting into their babies and so we would have children coming in floppy with heat exhaustion, dressed in beanies in the 30 degree heat. We would try to explain that fevers were best treated by cooling children down and demonstrate with wet rags. The mothers would dutifully nod, dress their babies back up in their multiple layers and ask for "the pills". One-off pills and even better injections were often conceptualised as being able to treat almost anything. A lack of understanding about the need for behavioural changes and long term treatments were a complication of this perception. We were seen by the locals as especially powerful and if we didn't give some treatment, we were wilfully denying a patient a cure. Many patients with tuberculosis who were already being managed (albeit somewhat sporadically) under the World Health Organisation programme came to us, convinced that pills from white doctors would be their cure, despite being on long term appropriate tuberculosis treatment.

THE CENTURY OF THE SYSTEM

The embryonic health system I saw in Indonesia seemed to me to have a malformation in that it did not address the root causes of health problems. We are easily captivated by what we can see, be it a sick baby being cured, or medical equipment. But I was crushed by a baby dying and equipment wasted. I know now what these people require for an improvement in their health is what is less able to be seen – education of mothers, empowerment and a feeling of control over health.

The systemic public health problems in Indonesia are numerous and I came to realise that there is no quick-fix solution. Indonesia has a very dysfunctional health system, however the system cannot be improved in isolation, as the political structure of Indonesia and the corruption seen at all levels of governance hinder development. There is little logic in the distribution of funding. For example, new hospitals were built with expensive equipment such as MRI scanners but they are understaffed by staffs that have been inadequately trained, which was evident when we went to the 'big' hospital on Tello Island.

On a different scale the public health centre (Puskesmas) on the smaller island we worked on was funded sufficiently to have nursing staff but since there was no accountability to anyone so the staff essentially took their salary and did not show up for work. These are frustrating examples and show the progress Indonesia must make in improving its healthcare provision. Likewise, issues such as tobacco taxing and advertisements, which could have a huge impact on health outcomes and disease burden, did not seem to have been addressed at all. What governmental and non-governmental organisation (NGO) education there was on clean water and mosquito nets was ineffective as the islanders didn't have the resources to implement these changes.

CLEAN TOILETS AND SELF-CLEANING LAGOONS

Six months before our arrival, Western volunteers had put rain water tank systems into all seven schools on the island. None of these tanks were functioning during our visit because there is no money or motivation to maintain them. This clearly illustrated for me that public health interventions cannot be a one-off, coming from outside the community and again, cultural differences are fundamental to this process. One island we visited has a luxury surf resort on it and Australian surfers fly in for ten day retreats. The owner told me how some surfers had offered to build a toilet block for the village on the other side of the island. The village chief had been highly sceptical and told the resort that if they really wanted to build toilets they could, but they would need to send someone to clean them each day and maintain them. This is a good example of how easy it is to fall into the trap of thinking the Western way is the right way. My thought patterns would go along the lines of: *they don't have any toilets – toilets are necessary and good for health and the environment – they are getting free toilets – how ungrateful!* The village chief is more likely to have thought: *we are perfectly happy with our current system of defecating into the sea – we don't need an ugly building which will not work properly in a few years – no thanks!*

Another illustration of intermittent western involvement was our travelling clinics. The management of diseases such as diabetes, peripheral vascular disease and stroke was very difficult due to the transient nature of medical services. A good example is that blood pressure medications were only available from a pharmacy located two hours away by boat. It was easy to begin blood pressure control and others before us had (with medication donated from New Zealand), but I found it difficult to see the point without long term follow-up, or money for medication. Chronic disease prevention and management is all about lifelong interventions, and I found this pill approach frustrating. I equally found the prior lack of education around essential health issues such as smoking, open fires and obesity frustrating. Maybe we could have given 'lifestyle advice', but honestly the people I met did not have the resources required to make many choices about their 'lifestyle'.

WHAT NEXT?

After my time in Indonesia, I appreciate that medicine doesn't work very well in isolation. Without a functioning health system and competent colleagues to refer to, much of what we saw we could not effectively manage or treat. We made a difference for the few lucky individuals with acute conditions who happened to be in the right place at the right time. However, education, money for resources such as clean water systems (and a drive from within communities to implement these), and a transparent and effective health system will be what really improves health.

WHEN ALL OUR BABIES LIVE

I don't know why it took a baby dying in front of me to make me finally begin to really think about global poverty but I want to say to you that as future doctors - we cannot live our lives in the bubbles of our own communities. People only a phone call away are dying of preventable diseases. It's up to our generation to figure out what we want to do about it.

When breath becomes air

Paul Kalanithi

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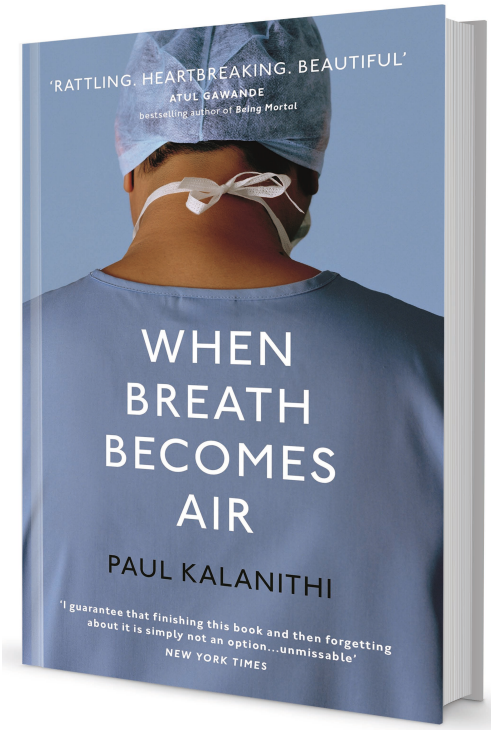

When Breath Becomes Air is the poignant yet poetic memoir of neurosurgeon-neuroscientist, Paul Kalinithi, who was diagnosed with metastatic lung cancer at the age of 36. During this dialogue with Kalanithi, he recounts his time as an undergraduate completing a master's degree in English literature, his time as a medical student, and his transition into the unrelenting world of neurosurgical residency.

A polymath with a relentless passion for learning, Kalanithi achieved a B.A. and an M.A. in English literature at Stanford, a Master's in Philosophy at the University of Cambridge, and attained his medical degree at the Yale School of Medicine, graduating cum laude in 2007. Fascinated by life's meaning and finitude, he described his pursuit of medicine as one to "bear witness to the twinned mysteries of death", he chose to further this understanding with a residency in neurosurgery, as the craft that dealt with life, death and meaning. It was during the final stages of his residency that Kalinithi developed a constellation of symptoms which ultimately resulted in a diagnosis of stage IV metastatic lung cancer.

Aptly named, after the poem "Caelica 83" by Baron Brooke Fulke Greville, Kalanithi's passion for English literature is prevalent, woven into his eclectic prose, as he recounts anecdotes from his years as a resident, revisiting times of bitterness and regret, times of success and times of reflection. His search is deep and unrelenting for explanation to his failures, and furthering his understanding of mortality.

Through his journey with illness, Kalinithi shares his deeply personal insights. Flipping through his own CT scan, wearing a patient's gown rather than his familiar scrubs, the tale of this doctor-turned patient will arouse an emotional response. The contrast between authoritative surgeon and meek patient reminding us that although as doctors and medical students we frequently bear witness to death, to truly understand its peculiarity, one must confront it on a personal level. Kalanithi excels here in narrating his own physical decline, while shedding light on the various ailments he accumulates. The weight of his story will be sure to linger for time to come, and underpin our understanding of mortality and what it means to be a patient.

Kalanithi wrote with difficulty as his health deteriorated, but he was determined to complete his memoir, and to understand what it all really means, what makes life truly worth living? The culmination of many years spent striving, short-circuited in an instant, the future he imagined vanished, he commences on a journey to learn how to live life outside the operating room. Early on in his illness, Kalinithi obsesses over statistics and Kaplan-Meier survival curves, while useful to the physician, he soon realises what little relevance these bear to patients. "What patients seek is not scientific knowledge that doctors hide but existential authenticity each person must find on her own… The angst of facing mortality has no remedy in probability". With this revelation, he shies away from medical science, and finds himself resorting to literature to find the answers to the metaphysical and existential questions he seeks.

Perhaps one of the most unsettling realisations of this memoir, is how often in medicine we are obsessed with delayed gratification. Seldom is one mindful of their present standpoint, rather focusing on what's next, where will I be in five years, ten years? This astute yet disconcerting realisation, arouses an appreciation for the day to day experiences, and the vast privileges we have in this role. Such insights are riddled throughout.

Ultimately, it is with his startling prose, that Kalinithi recounts a tale, not of struggle but one of triumph and fortitude, as a man so fascinated by death, so well acquainted with it, confronts his own mortality. After many hours, days and years spent in the OR trying to hone his craft, trying to perfect his talent, trying to further his understanding of human existence, he culminates with the insight that one "can't ever reach perfection, but you can believe in an asymptote toward which you are ceaselessly striving". Kalinithi died on Monday, March 9, 2015, surrounded by his family.

When Breath Becomes Air is a heartfelt autobiography, a personal dialogue, an insight into medicine, life and death, and a message to a new-born daughter. It is on these fronts that it not only succeeds, but excels. This one is simply not to be missed.

Being mortal

Atul Gawande

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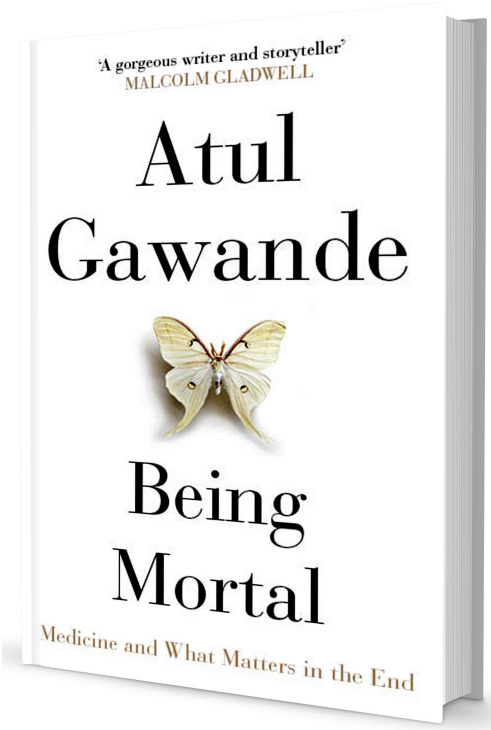
Rebekah's favourite part of practicing medicine is getting to ask patients how they're feeling. She is interested in psychology and clinical applications of genomic technology.



Death is hard to talk about, even if it is a part of your job. In his engaging book the author and surgeon Atul Gawande grapples with the very difficult subject of our finite existence.

He begins by briefly recounting the story of Ivan Ilyich, the main character of Tolstoy's novella, *The Death of Ivan Ilyich*. In this story Ivan Ilyich's doctors, family, and friends act as if he was just ill, seemingly in denial of the obvious signs he was dying. Instead of acknowledging his situation and offering comfort, the people close to Ivan Ilyich subjected him to treatments that only added to his suffering. Gawande argues that despite the scientific advancements since Ivan Ilyich's era doctors are still no better at dealing with death.

The book expands on this main theme with Gawande drawing from the experiences of patients, his interactions with those patients, and the death of his father, as well as philosophical and scientific arguments. He also compares historical and current attitudes and practices regarding the elderly in the developing and developed worlds. He candidly describes the inadequacies and failures of most common models of aged care while recognizing the concerns and expectations of family members, painting a picture of the tension between maintaining the independence so valued by many elderly patients and assurance that elderly parents are kept safe.

Too often the wishes of the elderly are not explored, resulting in them living out their last days in a way that minimizes both medical complications and their enjoyment of life. Nevertheless, Gawande relates examples of innovative people who have developed aged care facilities that manage to balance these competing priorities.

Difficult end-of-life conversations enable medical and surgical care that better reflects a patient's best interests. Unfortunately, doctors who shy away from these difficult discussions sometimes use prolongation of life as a default medical strategy. Instead doctors should base treatment decisions on an understanding of what makes a patient's life worth living. This understanding comes from asking patients to face their limited time and order their priorities. For example, a patient that derives meaning and happiness from sport should consider undergoing a risky palliative spinal cord tumour debulking even if all it will save is their tennis swing. Conversely, a tough conversation could prevent a painful and potentially dangerous trip to theatre when the patient would rather be on the couch eating ice cream and watching the rugby.

At first it seemed strange that Atul Gawande, Professor of Surgery at Harvard and creator of the WHO surgical safety checklist, would write a book on palliative care. However this makes sense when you appreciate that his famous checklist improves safety by facilitating communication in complex situations.

Ever the scientist Gawande and his team are currently running a randomized controlled trial of a 'Serious Illness Conversation Guide' designed for patients with incurable cancer.[1] Better communication between doctors and dying patients will not come easy, but it will be free and will help doctors more than any blockbuster drug or device.

This book will have a considerable impact on my future clinical practice. I now appreciate that geriatricians play an important, albeit unglamorous, role in making simple changes to patient's treatments that lead to significant improvements in quality of life. Reading it has given more depth to my understanding of shared decision making between the doctor and patient that has been alluded to in lectures. During conversations about death it is essential to ascertain what patient's truly value, what makes life meaningful to them, and what they consider unbearable suffering. The book has cemented the importance of openness and honesty with patients although this involves the challenge of navigating my own and the patients' emotions.

Being Mortal is for those who care for the dying so this is an essential read for every medical student.

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Five days at memorial: life and death in a storm-ravaged hospital

Sheri Fink

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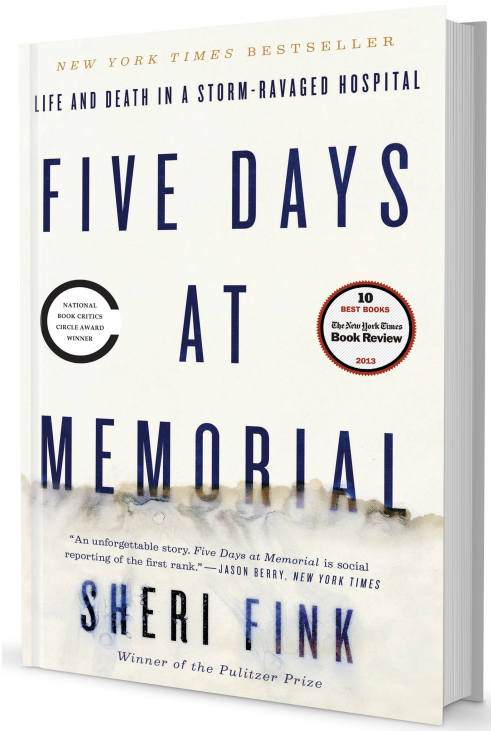

Hurricane Katrina still conjures up harrowing images for many people across the world. New Orleans encountered a direct hit from the hurricane which shredded homes and buildings all over the city and submerged the area in murky, polluted water that cut off much of the city's contact with the outside world. In the midst of this disaster zone stood Memorial Medical Centre, full of thousands of patients, staff and shelter-seekers left behind after a rushed evacuation of the city. With gunshots filling the humid air the hospital was left to survive on its own until help could arrive.

This is the story author and physician Sheri Fink explores in *Five Days at Memorial*. At face value one might easily assume that the book is a classic disaster tale of courage and valiant struggle. It soon becomes clear however that Fink is telling a more morally complicated tale.

Fink spends the first portion of the book recounting the night Katrina batters Memorial and captures the sheer ferocity of the storm in her writing. A noticeable lump in one's throat develops reading about how the thick glass windows of the Intensive Care Unit are completely ripped out as the concrete building convulsed in the wind. Through these chapters the professionalism and courage of the Memorial staff is clear, even in the face of a terrifying situation.

The book then turns to the events that followed the storm when record flood waters burst the storm levees, submerging the city and leaving Memorial isolated. Battling sweltering heat, deteriorating sanitary conditions and eventually the loss of backup power the hospital staff begin to see themselves more as disaster survivors than medical professionals. It is the consequences of this change in mentality that provides the real meat to *Five Days at Memorial*. Fink describes how patients were not given their medication or enough water despite adequate supplies of both. One nurse reportedly justifies this on the grounds that they were in "survival mode" and weren't really acting as a hospital. However, the author artfully contrasts this with hospital pharmacists who diligently continued recording prescriptions for painkillers which continued to be given to patients. The overall effect is to poignantly illustrate how often good and bad decisions can co-exist in people trying to do the right thing, a challenging thought for the idealistic reader.

However, the most disturbing part of the book concerns the euthanasia of patients while the evacuation was finally under way. The book details how it had been decided that some patients were not going to be evacuated due to their do-not-resuscitate status or, in one case, morbid obesity. This occurred despite a steady stream of helicopters available for patient evacuation and the plentiful food, water and medicine at Memorial. Fink describes the damning evidence showing staff used a combination of morphine and midazolam to end of lives of as many as twenty patients who were ill but nonetheless stable. Most striking was one obese but non-critical patient who was smothered to death when massive doses of morphine proved ineffective at ceasing his breathing.

The latter part of the book covers the investigation by the authorities into the events that took place at Memorial. The book details how in the post-Katrina milieu, a team of dogged investigators in the Louisianan Attorney-General's office launch a case against key doctor Dr Anna Pou and two nurses for second-degree murder at Memorial against strong opposition from the medical profession.

In all Fink approaches the events at Memorial with a realist attitude, recognising the courage of many staff in the face of adversity but also painting a cautionary tale of how well-meaning people can act in disturbing ways if their judgement becomes sufficiently impaired by stress and exhaustion. Detailed but never too dense, it is clear that the author has gone to pains to produce an accurate account of what occurred at Memorial during the fateful storm. Perhaps the best sign that *Five Days at Memorial* is an excellent read is the breadth of emotions it evokes in the reader; everything from wonder to anger. Whatever conclusions you draw from the events described in *Five Days at Memorial,* Fink's work undoubtedly highlights the moral complexities of doing good in difficult circumstances and that is a worthwhile lesson for all of us.

Interested in contributing?

GENERAL INFORMATION

The Editors of the New Zealand Medical Student Journal aim to support medical student development, be a forum for opinions and discussion, and publish the educational writing of medical students.
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- Use Microsoft Word
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- Visuals to be supplied seperately in high-res PDF format

TYPES OF SUBMISSION

Original research articles	<3,000 words
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Case reports	<1,500 words
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Letters	<500 words

CRITERIA FOR SUBMISSION

- Submissions are of interest to medical students
- Written approval from research supervisors is required
- Author's email address for correspondence is necessary
- Short blurbs about authors must be included
- Completed article coversheet, available from: nzmsj.com

STYLE

The British Medical Journal house style is to be followed. This is available at: bmj.com/about-bmj/resources-authors/house-style. Use the Vancouver referencing style, insert numbers within the text using superscript, do not use brackets around the numbers. Abstracts are required for research articles.

SUBMISSION

Email articles with author's blurb and a scanned copy of the cover sheet to: **chief_editor@nzmsj.com** with 'Article Submission' in the subject header.

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All submissions will be subedited for spelling, grammar and clarity. They will then be sent for expert reviews. Authors will be required to revise their articles during this process.
Final article selection for publication will be made in conjunction with our expert advisors and editorial board once the review and revision process is completed to a professional publishing standard.
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This is in keeping with our educational aim to assist medical students in making the transition from writing for medical school to writing as a graduate.

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