Letters

HOW MUCH CARDIOTHORACIC SURGERY IS TAUGHT IN UK MEDICAL SCHOOLS?

Editor,

The National Undergraduate Curriculum in Surgery was created by the Royal college of Surgeons of England in 2015. The curriculum aimed to provide guidance for medical schools creating an evidence-based, clinically relevant and contemporary curriculum for all students.[1] However, Cardiothoracic Surgery (CTS) is not included in many U.K. medical schools' curriculum. Our study aimed to evaluate how much cardiothoracic surgery is taught in UK medical schools.

A questionnaire consisting of 8 questions was designed to evaluate student's experiences in CTS during their undergraduate studies. Two questions were focussed on teaching specifically in Aortic Dissection (AD). The questionnaire was then sent electronically to final year medical students and foundation year one doctor graduated in 2018. Medical schools with no intake of medical students before the 2013-2014 academic year were excluded from this study. [2,3]

Three hundred and six senior medical students and recent graduates completed the questionnaire. Students from 16 U.K. medical schools responded. Thirty-two (10.45%) had a placement in CTS during medical school. Three (18.75%) medical schools integrated CTS as part of the undergraduate curriculum. One hundred and twenty (39.22%) had received teaching in CTS, mainly through small group tutorials and online lectures. All students received teaching on AD. Method of teaching was mainly through lectures (79.33%)

Cardiothoracic Surgery is not included as part of the undergraduate curriculum in most U.K. medical schools. Student experiences in cardiothoracic surgery vary even in the same medical school. However, AD was taught in all surveyed medical schools. Further work should be done to improve student's experience in cardiothoracic surgery during their undergraduate study, especially for students who consider cardiothoracic surgery as their future career.

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MYCOBACTERIAL ABSCESSES AFTER BCG VACCINATION

Editor,

A 25-year-old man was referred to the dermatology department with two lesions on his upper left arm. These were intermittently discharging pus and bleeding. There was no history of trauma and he was systemically well. He had no past medical history of note and was not taking medication. He was in the army and had been posted overseas to various countries including the middle east.

He recalled receiving a BCG vaccination to his left arm in 2014 with subsequent significant local reaction which resolved with scarring.

On examination, there were two erythematous nodular lesions on the lateral aspect of his left upper arm adjacent to the BCG scar. The superior lesion measured 20 x 10mm and the inferior lesion measured 12 x 13mm. There was no palpable axillary or cervical lymphadenopathy (Figure 1).

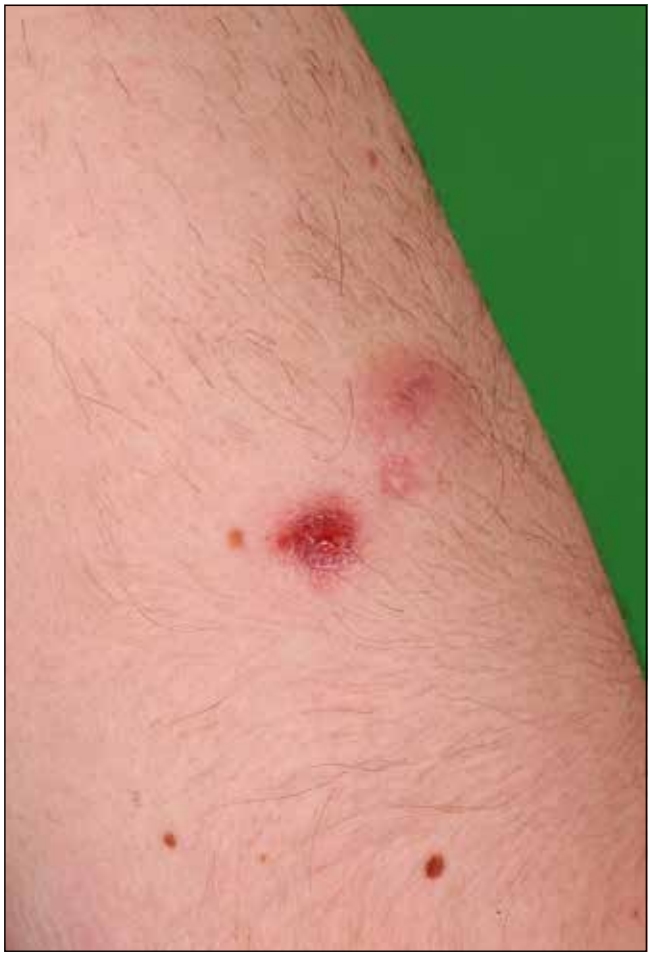

Fig 1.

Diagnostic punch biopsies were performed for histopathology and culture. Histopathology showed granulation tissue with two ill-defined microscopic granulomatous foci (Figure 2). MTB (Mycobacterium bovis) complex was cultured.

Additional PCR testing performed and confirmed a BCG strain.

The BCG strain was sensitive to Isoniazid, Ethambutol, Rifampicin and resistant to Pyrazinamide.

Other investigations included: Leishmaniasis serology negative, HIV negative, ESR, U&E, LFTs, CRP and Chest x-ray normal.

He was referred to infectious diseases clinic and prescribed Rifampicin, Isoniazid, Ethambutol and Pyridoxine for 9 months. At review after 2 months of treatment, the lesions were no longer itchy and were not discharging pus or blood. On examination, the lesions were less indurated and erythematous.

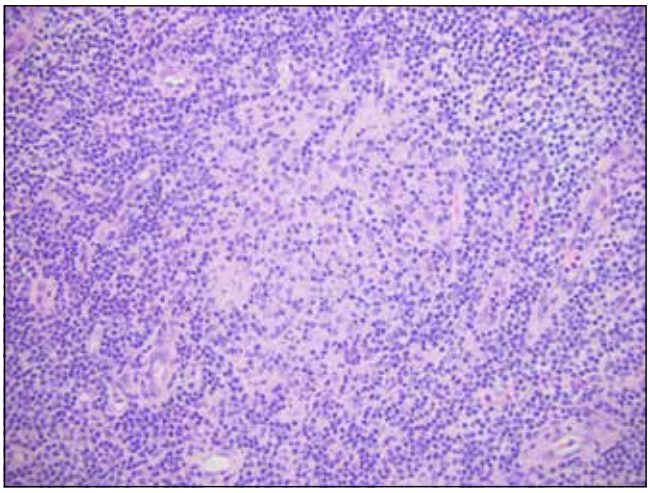

Fig 2.

The Bacille Calmette-Guérin (BCG) vaccine is a vaccine against Mycobacterium Tuberulosis infection which has been in use since 1921. BCG uses a strain of live attenuated Mycobactium Bovis.[1]

In the United Kingdom, the BCG vaccine was administered to all secondary school children until 2005 when a targeted programme for those at higher risk of TB was introduced.[1]

The BCG vaccine has been administered more than 4 billion times. Adverse events in BCG administration are rare. In a study of 117,533 vaccines abscesses were reported in 0.02% of patients[2] and in another study the incidence of BCG abscess of 0.05%.[3]

There are no large randomised control trials investigating treatment of BCG abscesses.

A random, open, group control study of 33 patients compared isoniazid vs isoniazid/rifampicin; the combination therapy showed a higher cure rate with acceptable side effect profile.[4] This was the case with our patient. There are case reports of surgical excision or observation

In summary, we report a case of BCG abscesses as a rare adverse reaction to the BCG vaccine in an immunocompetent individual. These abscesses are currently responding to treatment with anti-tuberculosis medications. This case highlights that MTB infection should be considered in patients who present cutaneous eruptions after receiving BCG vaccination.

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NOTIFIABLE VIRAL INFECTIOUS DISEASES: IDENTIFYING PATTERNS OF LEARNING IN CLINICAL DECISION SUPPORT

Editor,

Notifiable viral infectious diseases are a significant public health risk and it is important for frontline healthcare professionals to correctly detect and diagnose patients with these diseases. Healthcare professionals can use online clinical decision support resources to ensure that their knowledge of these diseases is evidence-based, practical and current.[1] However, there are few analyses on *how* doctors use clinical decision support tools at the point-of-care or how they use them in specific specialties - such as the field of infectious diseases.[2,3] The purpose of this report is to attempt to fill this gap in the literature by analysing the usage of a point-of-care decision support tool - BMJ Best Practice - in the field of viral infectious diseases.

In December 2018, we conducted an analysis of patterns of use on BMJ Best Practice related to notifiable viral infectious diseases over the previous 12 months.[4] We looked to see which of the notifiable viral infectious diseases generated the most usage on the clinical decision support tool and also which sections of the content were most used.

We found that the most common notifiable viral infectious diseases are the most used. The most viewed diseases include measles, hepatitis C, Ebola virus infection, hepatitis B, and mumps. With the exception of Ebola, these are amongst the most common notifiable viral infectious diseases worldwide.[5] Thus, it is not surprising that these are well-used. However, this also suggests that the content is being used to guide practical and common decisions that doctors and healthcare professionals take every day. The exception is Ebola – this is still a rare disease. However, it has received a great deal

of public attention and this may account for some of its popularity.

We also looked at what sections of the topics received most views. The sections of the topics with the most page views suggest a clear pattern of usage. The top two sections include the topic homepage and the "highlights-summary" page. However, this is to be expected as these are the first pages that users land on when they go to a topic.

Where they go next is of more interest; and here there are clear messages from the data. Six of the next ten most popular sections relate to diagnosis – these include the sections on "approach to diagnosis", "history and examination", "differential diagnosis", "investigations", "diagnosis: step-by-step" and "case history".[4] Of the remaining, three relate to issues in management. These include the sections on "treatment options", "treatment details", and "approach to management".

The data suggests that users are utilising the clinical decision support tool to aid their decisions in diagnosis and management of notifiable viral infectious diseases and that they need help in the basics of taking a history, conducting an examination, ordering tests and ruling in or out differential diagnoses.[5] Equally it may be that they want to confirm what they are doing is correct. The usage behaviour is largely related to the clinical workflow and suggests that users are using the tool at the point-of-care and not as a referential source that they might look at after the clinical event.

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ANTIMICROBIAL PROPERTIES OF NATIVE ULSTER MACROFUNGI (MUSHROOMS AND TOADSTOOLS) TO CLINICAL PATHOGENS

Editor,

Previously, our research group has reported in the *UMJ* on various traditional Ulster cures and remedies (January 2009)[1] and on the physiological basis of the antibacterial activity emulating such cures and remedies (January 2009)[2]. In addition, we have examined the antimicrobial properties of sphagnum moss and its role in the Great War 1914-1918, relating to bandage preparation and wound dressings.[3] To date, we have not examined the antimicrobial properties of native macrofungi, namely the mushrooms and toadstools and therefore, it was the aim of the current study to examine the activity of native Ulster macrofungi on clinical bacterial and fungal pathogens.

Fig1a Coprinus comatus: Dick Culbert, B.C., Canada

Twenty-two species of native macrofungi were collected from woodlands throughout Northern Ireland (Table 1). *Lentinula edodes* (Shiitake mushroom) was also examined, given its popularity as a constituent of Asian (mainly Japanese) cuisine. Formal identification of all macrofungi examined was made by PCR-DNA techniques, employing fungal 18S rDNA universal ITS 1 and ITS 4 primers (ITS1: TCC GTA GTT GAA CCT GCG G and ITS4: TCC TCC GCT TAT TGA TAT GC). Aqueous and protein extracts (approx.1mg/ml) were obtained from freeze-dried preparations of each fungus. Six bacterial and one fungal pathogen were examined

in this study (Table 1), including the Gram-positive bacteria (*Bacillus cereus, Listeria monocytogenes, Staphylococcus aureus* (methicillin-sensitive), *Staphylococcus aureus* (methicillin-resistant), the Gram-negative bacteria (*E. coli* O157, *Klebsiella aerogenes*, *Pseudomonas aeruginosa*) and the fungal pathogen, *Aspergillus flavus*. All isolates were obtained from the HSC MicroARK Northern Ireland Microbiology Repository, located at the Northern Ireland Public Health Laboratory, Belfast City Hospital (www.microark.com). Antimicrobial properties were determined on each fungal extract/pathogen combination by standard disk diffusion assay.

All native fungi, except for *Agaricus bisporus* (the common mushroom) demonstrated antimicrobial activity against at least one of the extracts to one of the clinical pathogens tested (Table 1). Two native fungi, *Coprinus comatus* and *Leucopaxillus tricolor* were active against all of the pathogens tested. *Lentinula edodes* (Shiitake mushroom) was also active against all of the pathogens tested. Overall, aqueous extracts were more antimicrobial than the protein extracts examined.

Coprinus comatus is commonly seen in Northern Ireland (Figure 1a) and is sometimes known as shaggy ink cap, lawyer's wig, or shaggy mane, due to the white cap of the fungus being covered in scales. Other recent studies have also shown this fungal species to exhibit potent antimicrobial properties.[4] *Leucopaxillus tricolor* (Figure 1b) is found

TABLE 1:

Antimicrobial activity of aqueous and protein extracts of 23 macrofungi against clinical pathogens

	Aqueous Extract	PPER* Extract
Agaricus augustus		*Listeria monocytogenes*
Agaricus bisporus		
Amanita sp.	*Staphylococcus aureus, MRSA***	
Boletus chrysenteron	*Staphylococcus aureus*	*Listeria monocytogenes*
Clitocybe sp.	*Staphylococcus aureus, MRSA*	*Listeria monocytogenes*
Coprinus comatus	*Bacillus cereus, E. coli O157, Klebsiella pneumoniae Listeria monocytogenes, MRSA, Pseudomonas aeruginosa*	
Gymnopilus junonius	*Klebsiella pneumonia, Listeria monocytogenes, MRSA*	*Listeria monocytogenes*
Gymnopus confluens		*Listeria monocytogenes*
Hygrocybe nigrescens		*Listeria monocytogenes, Aspergillus flavus, E. coli O157*
Hypholoma fascicularis	*Listeria monocytogenes*	
Inocybe geophylla	*Staphylococcus aureus*	*Listeria monocytogenes, Aspergillus flavus*
Laccaria amethystine	*Staphylococcus aureus, MRSA*	
Lentinula edodes	*Aspergillus flavus, Bacillus cereus, E. coli O157, Klebsiella pneumoniae, Listeria monocytogenes, MRSA, Pseudomonas aeruginosa*	
Leucopaxillus tricolor	*Bacillus cereus, E. coli O157, Klebsiella pneumoniae, Listeria monocytogenes, MRSA, Pseudomonas aeruginosa, Staphylococcus aureus*	*Aspergillus flavus Listeria monocytogenes*
Mycena rosea	*MRSA, Staphylococcus aureus*	*Aspergillus flavus, E. coli O157, Listeria monocytogenes*
Mycena sp.		*E. coli O157, Listeria monocytogenes*
Psathyrella candolleana	*Bacillus cereus*	
Pseudotrametes gibbosa	*MRSA, Staphylococcus aureus*	
Russula cyanoxantha		*Aspergillus flavus, Listeria monocytogenes*
Russula nigricans	*MRSA, Staphylococcus aureus*	
Russula parazurea		*Listeria monocytogenes*
Russula sp.		*Listeria monocytogenes*
Trametes versicolor	*MRSA, Staphylococcus aureus*	

Where no value is recorded there was no inhibition in any of the clinical pathogens tested
*PPER = Plant Protein Extraction Reagent
**MRSA = methicillin-resistant Staphylococcus aureus

growing in woodland litter and is composed of three coloured components, namely a brown cap, yellow gills and a white stem, hence the epiphet name, *tricolor*. *Lentinula edodes* (Figure 1c) is a common constituent of Asian cuisine and has been shown previously to have antimicrobial properties.

Fig 1b Leucopaxillus tricolor: Eva Skific (Evica)

Antimicrobial resistance (AMR) has now emerged as a major global public health problem. Locally in Northern Ireland, the extremes of AMR manifest as multi- and pan-resistant Gram-negative respiratory infections in patients with cystic fibrosis (CF), particularly associated with *Pseudomonas aeruginosa* and *Burkholderia cenocepacia,* which can cause a treatment dilemma due to a shortage of active antibiotics.

In conclusion, this study has identified extracts from native local macrofungal species to have an antimicrobial activity against several clinical pathogens. Given the need to search for novel antimicrobial compounds coupled with the agrarian background of Northern Ireland's economy, further work should be undertaken to identify other local sources of antimicrobials and a mechanism established amongst the relevant government agencies, academia and patient groups, to help such novel compounds enter into the drug discovery pathway, so that any potential medicinal value can be fully exploited.

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Fig 1c Lentinula edodes: Fankenstoen from Portland, Oregon, USA

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