Pathological Society of Great Britain & Ireland

‘There is no place for pathology in modern medical curricula’

Discuss

Introduction

The place of pathology in modern medical curricula has been challenged in recent years by the growing preference for integrated undergraduate medical courses, with learning often centred on clinical cases, rather than a more structured understanding of the underlying basic sciences. In some medical schools, this has led to pathology being marginalised. In others, however, pathologists have developed novel and innovative means of integrating pathology with the rest of the clinical course.

This essay examines some of the literature surrounding these changes, evaluating the evidence regarding the type and extent of the changes in medical curricula, and the effect that these may have on the profession. This essay focuses on papers published in English, including those from Canada, Australia and the USA, as well as the UK. However, the changing face of medical curricula is a world-wide phenomenon, and there are many papers dealing with similar upheavals in the teaching of pathology throughout the world, including countries such as Japan,

Thailand, Germany, Spain, the Netherlands, Pakistan and Tunisia. While there are also changes in the curricula and teaching methods for pathology in postgraduate medical education[1,2], this essay will focus on the literature surrounding changes in undergraduate medical curricula.

Pathology may be defined as 'the study of disease processes with the aim of understanding their nature and causes'[3]. In practice, it includes the disciplines of tissue pathology (histopathology, cytopathology and autopsy), microbiology, immunology, haematology, clinical chemistry, and molecular pathology. Much of the literature focuses on tissue pathology – a prejudice which is inevitably reflected in this essay.

It is interesting that pathology is apparently becoming a less prominent feature of medical curricula at a time when fictional pathologists are increasingly prominent: forensic pathology is featuring even more heavily on television shows, such as the successful *CSI* franchise[4], and Silent Witness; and the recent critically-acclaimed film adaptation of Somerset Maugham's *The Painted Veil* even stars Edward Norton as a microbiologist. Could popular culture have a role in raising the profile of pathology?

Integrated pathology courses in the USA

Some of the best data for understanding the changing face of modern medical curricula in general, and the place of pathology in particular, come from large-scale, longitudinal studies of medical curricula. For example, Kumar *et al.* conducted a study of 83 medical schools in the USA, using a questionnaire to assess the changing structure of pathology curricula over a seven-year period, from 1993-1999[5]. They found that, as one might expect, the teaching of pathology had been increasingly

integrated with other disciplines over that time. Thus, from 1993-1999, the percentage of surveyed schools with ‘some degree of integration’ for the teaching of clinical pathology increased from 48% to 65%, while that for systemic pathology increased from 31% to 51%.

Interestingly, the increased degree of integration apparently did not lead to a significant reduction in the mean number of hours allocated to pathology tuition per year, which dropped by only 5 hours from 201 hours in 1993 to 196 hours in 1999. Similarly, the average proportion of this time that was devoted to lectures changed very little over this period, from 52.2% in 1993, to 53% in 1999.

However, it must be borne in mind that, firstly, this research was based on questionnaires about the curriculum as published for each of the classes entering during 1993-1999, not on records of what teaching actually happened. Secondly, in some of the most integrated courses, or those which are case-based, the researchers found it impossible to ascertain the number of hours devoted to pathology. Thus, for the courses about which there is perhaps most concern that pathology teaching is being neglected, no detailed data is available. The results suggesting that modern curricula do not lead to reduced coverage for pathology may thus be misleadingly hopeful, as they specifically do not take account of the most ‘modern’ programmes. In addition, it must be borne in mind that an earlier survey suggested that the average number of hours of pathology teaching had already decreased by 20% over the preceding 10 years[6]. Thus, even if the amount of pathology tuition did not decrease significantly from 1993 to 1999, that does not necessarily mean that it is at a sufficiently high, ‘pre-modern’, level.

One of the major shortcomings of the above study is that data about whether a pathology course is integrated, or the average number of hours devoted to pathology

teaching, give no reflection of the quality of teaching, the methods used, or the amount of pathology learnt and understood by the medical students. However, two of the authors of this original study went on to examine whether there was a correlation between students' results in the Step 1 section of USMLE (United States Medical Licensure Examination), and whether the student had studied on a 'modern' integrated course.

This study found that there was no significant difference in mean Step 1 scores between those who had undertaken an integrated course, compared with non-integrated[7]. This was found to be true both of the Step 1 Total score, and of the Step 1 Pathology score alone. There was a rise in Step 1 scores (both Total and Pathology) during the study period of 1995-2000, during which many schools changed to integrated courses. However, this improvement in Step scores seemed to correlate with, and was attributed to, an improvement in undergraduate Grade Point Average and Medical College Admission Test scores. In other words, although medical students on average performed better on USMLE after more of their medical schools had adopted integrated courses, this was probably due to the students being better at exams, or exams across the board becoming easier, rather than because the integrated courses taught them better.

Computer-based teaching

Medical schools worldwide have developed new methods of teaching pathology, which aim to combine the potential for computer-based resources with 'modern' ideas of case-based learning; they also tend to take account of the equally common modern phenomenon of insufficient academic pathology staff.

One example of such an approach comes from Griffith University in Queensland, Australia, where staff developed ‘a series of 32 clinical pathological cases’, which aimed to ‘replicate clinicopathological conferences in a small group format’[8]. The students worked through the cases with the aid of clinical tutors, supported by a range of web-based resources on the clinical school’s Intranet. This allowed students to view digital images of pathology slides and specimens – a common feature of many modern courses. The authors of the paper describing this course say that feedback for this course was very positive. They also mention its suitability for use elsewhere, given its primarily web-based nature, and the fact that it is ‘sustainable with only one academic pathologist’. However, some might worry that this could convince medical schools that numbers of academic pathology staff can be reduced, which may merely serve to decrease the value placed on such staff, while simultaneously increasing their workload.

Another novel approach to teaching pathology attempts to use modern computer facilities to deliver the best of ‘traditional’ pathology teaching, in resource-limited departments. Pathologists from the University of North Carolina have argued that perhaps the most valuable learning experiences for students of pathology came from interactions with pathologists, with discussions centred on slides or specimens. While it would be impossible for most medical schools to provide enough academic pathologists for such intensive individual teaching, some of this experience can be simulated on computers, with digital images and animations being accompanied by recorded narration and explanation from a pathologist[9]. The learning experience can be made more interactive by incorporating questions for the student as part of the video tutorial.

Using new methods to teach pathology in such an imaginative way are laudable, but, as with all computer-dependent teaching, they are very reliant on the computer-literacy of the academic staff, and on the IT infrastructure of the medical school. In addition, one must not forget that, for all the wonders of computers, there is little compensation for being able to discuss a query with a trained pathologist.

Effects on the discipline

Whatever the current place of pathology in modern medical curricula, research from the Guy's, King's and St Thomas' (GKT) School of Medicine suggests that it is not enough. A detailed series of interviews with new PRHOs found that, while a new final year programme of close working with clinical teams gave junior doctors greater confidence with clinical skills, 'they reported lack of knowledge in pathology and therapeutics'[10]. While it is commendable if new approaches to medical education can better prepare junior doctors for the tasks that they will face day-to-day, it would be a great pity if this apparent competence came at the expense of an understanding of the pathological processes underlying the diseases they spend their time treating.

Professor David Weedon, Former-President of the Royal College of Pathologists of Australasia, has similarly expressed concern that 'the role of pathology has been downgraded and marginalised with the ascendancy of problem-based learning in Australian medical schools'[11]. Of particular concern to him is the diminishing number of academic pathologists – he cites the example of an un-named Australian medical school which has no independent pathology department, and of another with only one half-time pathology academic. The Royal College of

Pathologists of Australasia has attempted to raise the profile of pathology with an annual 'Pathology Week', but ultimately Weedon concludes that pathology, and in particular academic pathology, will only flourish when the salaries are more competitive with those elsewhere in medicine.

The replies to Weedon's article included two from surgeons, who argued that the basic disciplines of anatomy and physiology were similarly neglected under new curricula, leading to doctors untrained in 'the mechanism of disease and understanding physical findings'[12,13].

The potential dearth of pathologists that Weedon fears may already be a reality in Europe, according to a study carried out in 2002, which surveyed the provision of histopathology consultants and trainees in 18 European countries[14]. Interestingly, the study found that >10% of the consultant histopathologist positions were vacant in 2002 in the UK, but <10% of the trainee positions were vacant. Rather worryingly, they found that in all the countries for which data were available, 'the number of trained histopathologists outnumbers that of the trainees'.

In contrast to this, there is research suggesting that, in fact, having medical schools change from 'traditional' to 'integrated' courses did not significantly affect whether students wanted to specialise as pathologists. One study in Canada used data from the Canadian Resident Matching Services between 1993-2004 to look at the choices of medical school graduates, when applying for residency programs[15]. The authors asked representatives of the 13 English-language medical schools in Canada whether or not their preclinical curriculum contained 'a dominant component of PBL'. They then compared the proportion of students who ranked pathology programmes first at PBL-dominant versus non-PBL-dominant institutions.

The authors found that, on average, pathology residency programs were ranked first by ‘1.1% of non-PBL graduates and 1.2% of PBL graduates’. In other words, a PBL approach does not apparently lead to a decrease in the number of medical students applying to train as pathologists.

Of course, this encouraging result must be tempered by an awareness of the study’s limitations. In particular, while the study looked at 14370 students over a 12-year period, the small percentage of students who selected pathology as a first-choice means that, in total, only 174 students ranked pathology first in that time. This relatively small number may thus be an insufficient basis for firm conclusions. In addition, a declaration by phone-call or email from a ‘representative’ of the medical school regarding the PBL component of a course may not be a fair representation of the pathology component of the course. This shortcoming is acknowledged by the authors, but they argue that it is currently the best method available, given that ‘there appears to be no recognized standard of what constitutes a PBL curriculum’.

Furthermore, research from the USA suggests that pathology courses may actually have very little effect on students wanting to become pathologists. One study looked at the influence of a second-year pathology course on perceptions of pathology as a potential career amongst medical students in Illinois, Indiana and Oklahoma[16]. Using surveys from about 1500 students, they compared knowledge of, and attitudes to, careers in pathology before and after taking the pathology course. Interestingly, they found that students had a better (though still often flawed) understanding of what being a pathologist entailed after the course, but there was not a significant increase in the proportion of students wishing to become pathologists themselves. One of the main factors identified by the students as a reason for not choosing pathology was the

perception of limited patient contact. Though, as the researchers point out, for some students the lack of patient contact was viewed as a positive feature of the career.

Conclusion

Thus, an examination of the literature shows that the development of ‘modern’ medical careers is an ongoing process: most new courses attempt to integrate pathology teaching within clinical case-based scenarios, but the precise type and degree of integration varies widely between medical schools, and the effects that the new curricula may have, both on students’ performance in exams, and as future doctors and potential pathologists, are unclear. Contrary to common fears, most research suggests that integrated courses do not significantly reduce the amount of time students devote to pathology, nor does it make them less likely to specialise as pathologists, or to perform well in pathology exams.

In an effort to decrease traditional didactic teaching methods, many pathologists have embraced the potential of new technology, particularly the use of digital images of gross and microscopic specimens to teach tissue pathology. These can not only be incorporated in conventional lectures, but can also form part of Internet-based teaching sessions and revision materials.

Perhaps the most worrying theme of the literature is that some of the curriculum changes are motivated less by enthusiasm for new educational methods, and more by financial limitations and the shortage of academic pathology staff. Insufficient numbers of pathologists, especially in academia, seems to be a common problem, described in Australia and much of Europe. It currently seems unclear from

the research to what extent the new approaches to teaching medical students will remedy or exacerbate these problems.

There are undoubtedly changes in modern medical curricula, and pathology is perceived as being disproportionately, and adversely, affected. To counteract these concerns, one should perhaps remember that previous curriculum changes have not always been disastrous. For example, it may seem hard for current medical students to believe that the medical school at the University of Manchester introduced OSCEs (Objective Structures Clinical Examinations) barely 10 years ago[17]. Since then, OSCEs have been widely adopted and accepted as a fair means of examination, even amongst some of the most 'traditional' medical schools. Change should not be sought merely for its own sake; nevertheless, well-thought-out reforms may be beneficial to both teachers and students.

In conclusion, both clinical necessity and the medical education literature suggest that pathology does have a place in modern medical curricula. The position of pathology may be precarious, but its prospects are promising.

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