Abstract

A recent study raised concerns regarding the ability of the health professions admission test (HPAT) Ireland to improve the selection process in Irish medical schools. We aimed to establish whether performance in a mock HPAT correlated with academic success in medicine. A modified HPAT examination and a questionnaire were administered to a group of doctors and medical students. There was a significant correlation between HPAT score and college results ($r^2: 0.314, P = 0.018$, Spearman Rank) and between leaving cert score and college results ($r^2: 0.306, P = 0.049$, Spearman Rank). There was no correlation between leaving cert points score and HPAT score. There was no difference in HPAT score across a number of other variables including gender, age and medical speciality. Our results suggest that both the HPAT Ireland and the leaving certificate examination could act as independent predictors of academic achievement in medicine.

Introduction

The selection process for entry to medical school has become a controversial topic both within the medical community and the mainstream media. Whilst academic ability remains a key quality for medical school entrants, attributes such as empathy, good communication and problem solving abilities are essential skills relevant to the selection of future doctors. If these are the additional criteria by which medical students are selected, then a transparent and well validated method of identifying these traits is vital. In 2009 the health professions admission test (HPAT) Ireland was introduced as an additional entry criterion for students attempting to gain admission to Irish medical schools. This brought Ireland in line with the medical school admission policies of many western countries, for example, the graduate medical admissions test (GAMSAT - Australia), medical school admissions test (MSAT United Kingdom) and medical college admissions test (MCAT United States of America).

A recently published paper has raised questions about the HPAT Ireland, citing relatively poor performances by graduate Australian medical school admissions test (GAMSAT - Australia), medical school admissions test (MSAT - United Kingdom) and medical college admissions test (MCAT - United States of America).

The selection process for entry to medical school has become a controversial topic both within the medical community and the mainstream media. Whilst academic ability remains a key quality for medical school entrants, attributes such as empathy, good communication and problem solving abilities are essential skills relevant to the selection of future doctors. If these are the additional criteria by which medical students are selected, then a transparent and well validated method of identifying these traits is vital. In 2009 the health professions admission test (HPAT) Ireland was introduced as an additional entry criterion for students attempting to gain admission to Irish medical schools. This brought Ireland in line with the medical school admission policies of many western countries, for example, the graduate Australian medical school admissions test (GAMSAT - Australia), medical school admissions test (MSAT - United Kingdom) and medical college admissions test (MCAT - United States of America).

A recent study raised concerns regarding the ability of the health professions admission test (HPAT) Ireland to improve the selection process in Irish medical schools. We aimed to establish whether performance in a mock HPAT correlated with academic success in medicine. A modified HPAT examination and a questionnaire were administered to a group of doctors and medical students. There was a significant correlation between HPAT score and college results ($r^2: 0.314, P = 0.018$, Spearman Rank) and between leaving cert score and college results ($r^2: 0.306, P = 0.049$, Spearman Rank). There was no correlation between leaving cert points score and HPAT score. There was no difference in HPAT score across a number of other variables including gender, age and medical speciality. Our results suggest that both the HPAT Ireland and the leaving certificate examination could act as independent predictors of academic achievement in medicine.

A modified HPAT was administered to a group of doctors and medical students. This was a shortened version of a sample HPAT, comprising of 22 questions divided into 3 sections: logical reasoning and problem solving (9 questions), interpersonal understanding (7 questions) and non verbal reasoning (6 questions). It was administered over 21 minutes.

In the majority of cases (43, 77%) it was completed in a controlled environment as part of a group. In the remainder (13, 23%) the test was self administered. Tests were marked by a single examiner. A questionnaire was completed by all candidates at the time of sitting the examination. Candidates were asked to provide demographic information, leaving certificate results and college examination results. A college examination score was calculated using a sum of overall results for first through fifth year of college and the results from the individual subjects of medicine, surgery, obstetrics and gynaecology, paediatrics and psychiatry in final year. A number of the final year students had not completed all of the individual final year subjects. In these cases a points total was summed based on the examinations that had been completed and then a proportional score was calculated. Differences between groups were assessed using an analysis of variance (ANOVA) with post hoc analysis using Scheffes test. Correlations between continuous variables were assessed using a Spearman rank. Data is represented as mean – standard error of mean (SEM).

Results

A total of 27 doctors and 29 final year medical students completed the examination. Tests were completed by candidates from 2 university teaching hospitals and a medical school affiliated to the national university of Ireland.

Participant demographics are listed in Table 1. The maximum achievable score in the modified HPAT was 110. The mean overall score was 62.9 (range 30 – 100). There was no difference in HPAT score between male and female participants ($72.2 – 3.4$ vs. $59.4 – 3.5$, $P = 0.118$) and there was no correlation between age and score ($r^2: 0.2, P = 0.026$) in the majority of cases (43, 77%) it was completed in a controlled environment as part of a group. In the remainder (13, 23%) the test was self administered. Tests were marked by a single examiner. A questionnaire was completed by all candidates at the time of sitting the examination. Candidates were asked to provide demographic information, leaving certificate results and college examination results. A college examination score was calculated using a sum of overall results for first through fifth year of college and the results from the individual subjects of medicine, surgery, obstetrics and gynaecology, paediatrics and psychiatry in final year. A number of the final year students had not completed all of the individual final year subjects. In these cases a points total was summed based on the examinations that had been completed and then a proportional score was calculated. Differences between groups were assessed using an analysis of variance (ANOVA) with post hoc analysis using Scheffes test. Correlations between continuous variables were assessed using a Spearman rank. Data is represented as mean – standard error of mean (SEM).

In the majority of cases (43, 77%) it was completed in a controlled environment as part of a group. In the remainder (13, 23%) the test was self administered. Tests were marked by a single examiner. A questionnaire was completed by all candidates at the time of sitting the examination. Candidates were asked to provide demographic information, leaving certificate results and college examination results. A college examination score was calculated using a sum of overall results for first through fifth year of college and the results from the individual subjects of medicine, surgery, obstetrics and gynaecology, paediatrics and psychiatry in final year. A number of the final year students had not completed all of the individual final year subjects. In these cases a points total was summed based on the examinations that had been completed and then a proportional score was calculated. Differences between groups were assessed using an analysis of variance (ANOVA) with post hoc analysis using Scheffes test. Correlations between continuous variables were assessed using a Spearman rank. Data is represented as mean – standard error of mean (SEM).

Figure 1: Graph depicting the relationship between leaving certificate score and HPAT score

There was no difference in HPAT score between participants who had to repeat one or more subjects in college and those that did not ($54.4 – 4.8$ vs. $64.3 – 2.8$, $P = 0.166$). Similarly, there was no difference between those who had to repeat one or more years in college and those who did not ($40.0 – 10$ vs. $63.7 – 2.5$, $P = 0.077$). There was no difference between the HPAT score obtained by the different medical grades or speciality of participant ($P > 0.05$).
The Health Professions Admission Test (HPAT) Score and Leaving Certificate Results Can Independently Predict Academic Performance in Medical School: Do We Need Both Tests?

Academic performance as determined by scores in the leaving certificate examination has been the traditional method for selecting Irish medical undergraduates. The phenomenon of grade inflation, accelerating the leaving certificate points race, as well as an increasing desire for well rounded medical graduates, lead to the addition of the HPAT to Irish medical school entry requirements in 2009. The ability of college entry criteria, including academic performance, aptitude testing and interview, to predict medical students' and doctor's performance is controversial with much conflicting data available. A meta-analysis by Ferguson et al determined that prior academic ability was a moderate predictor of undergraduate medical success, concluding that academic performance in school accounted for 23% of the variance in undergraduate scores.

Furthermore the meta-analysis found that second level results had only a small predictive effect for postgraduate medical competencies. Success in postgraduate medicine is, admittedly, more difficult to quantify, with many studies focusing solely on intern performance. A subsequent meta-analysis assessing interviews as a means of predicting future performance established a very small predictive effect for the interview in this setting. However, it did demonstrate a moderate predictive effect for estimating future clinical performance.

The retrospective data from our study suggest that the HPAT is an independent predictor of academic performance in medical school. This is reinforced by the finding that there was no significant correlation between a student's score in the leaving certificate examination and their mock HPAT score. There was, however, also a significant correlation between leaving certificate score and performance in medical school suggesting that this score can be used as a screening tool in the selection process. Our study does not specifically assess how well the HPAT or leaving certificate assesses a doctor or medical students ability to communicate, empathise or problem solve. It is difficult to conceive of a study that can directly assess these qualities - particularly traits such as empathy and compassion. It is perhaps reasonable to assume that these qualities are at least in part taught and examined in medical school and therefore excellence in medical school could be seen as a proxy marker for these relatively intangible qualities.

Alternatively it may be that these skills and personality traits are developed by years of post graduate working experience. Pre-assessment of these traits may always prove difficult and in fact may not be relevant as post graduate training may continue to effectively develop these attributes as required for a chosen field. Differing sets of skills and personality traits are better suited to different disciplines within medicine, all of which are important. In addition, on-going career development requires intermittent reviews and interviews which should provide a means for determining individual suitability to a given area, and may be more relevant than assessing and determining career outcome by further gatekeeping at point of entry to medical school. The issue of gender bias with regards to medical school admission tests has been raised with regards to the HPAT Ireland. Internationally, there is some evidence to suggest that the MCAT under-predicts how well females will perform in future medical exams. It is also postulated that UCAT has a favourable bias towards males. In our study there was an 11.6 % difference in total score for males and females. This was not, however, statistically significant. It is not clear if this difference would have attained significance with higher numbers of participants. It has also been suggested that the UKCAT has a potential bias towards students of higher socioeconomic class and private schools. Our study did not address this issue.

The fact that both the leaving certificate and HPAT independently predict how well an individual will perform in medical school raises the question of whether we need both tests to select medical students. What exactly the HPAT adds to the medical school admission process in Ireland remains to be answered. The rigorousness of entry to any medical school makes it, by its very nature, an additional process. The HPAT is no more or less competitive that the leaving certificate or an interview process. Touted by some in the mainstream media as a way to level the playing field for students, if anything it adds an extra layer of stress into the year prior to college entry. In addition, based on their performance in a mock HPAT, several currently practicing consultant doctors would potentially have been excluded from entry into medicine, further undermining the relevance of the interview. A limitation of the current study is the relatively small numbers involved. However, we feel that the statistically significant correlation between HPAT Ireland scores and academic performance demonstrated using a small sample of doctors and students emphasises the importance of further investigation of the HPAT. The first cohort of HPAT entrants to Irish medical school are currently entering their second year of studies. A formal retrospective or prospective study using these students grades would be vital in terms of conclusively validating or rejecting the HPAT as a suitable method for evaluating potential medical students.

Acknowledgements
The authors wish to acknowledge the help of Dr Denise Sadlier in administering the test.

Correspondence: WC Torreggiani
Department of Radiology, AMNCH, Tallaght, Dublin 24
Email: William.Torreggiani@amnch.ie

References

The Health Professions Admission Test (HPAT) Score and Leaving Certificate Results Can Independently Predict Academic Performance in Medical School: Do We Need Both Tests?