

Assessment of an objective structured clinical examination (OSCE) for undergraduate students in accident and emergency medicine

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SUMMARY

Conventional techniques for assessing the knowledge and clinical competence of undergraduate medical students are widely acknowledged as being unsatisfactory. We introduced an objective structured clinical examination (OSCE) for our fourth year medical students at the end of their accident and emergency (A&E) medicine attachment.

This paper outlines the organisation of the examination and the results of a comparison of marks obtained from the OSCE, from a multiple choice type examination and from a subjective rating of the students performance by their teachers.

We found the OSCE to be an acceptable form of examination to both medical students and examiners. Our results show significant correlation between marks obtained on the OSCE exam and subjective rating of the students ability. There was no statistically significant relationship to marks obtained on a multiple choice questionnaire exam. The OSCE format is particularly appropriate to A&E medicine where the participation of patients in traditional clinical examinations is impractical.

Key words: accident and emergency, examination, OSCE, undergraduate

INTRODUCTION

The way students are assessed is an important factor in what they learn.¹ The recognition of this fact has led to the phrase 'the tail that wags the dog' being used to describe the pivotal role of examinations in the process of undergraduate medical education.² Multiple choice question papers encourage learning directed to short term factual recall at the time of the examination and have little ability to measure clinical skills.³ Traditional formats of clinical examination lack objectivity as the students are assessed on different patients by

different examiners who mark the candidates subjectively.

The OSCE has been introduced by some medical schools as a better method of assessment of clinical skills than multiple choice question exams and a more objective measure of clinical skills than a conventional clinical examination.^{4,5}

The potential role of the A&E medicine department in undergraduate medical education has been highlighted by Yates⁶ in the UK and Burdick⁷ in the USA. If A&E medicine departments are to effectively take on an increased role in undergraduate education we must establish reliable and acceptable methods of assessing what is taught.

METHODS

Subjects

The subjects comprised medical students in their fourth year who were at the end of their A&E medicine clinical attachment.

The A&E OSCE

A series of 10 examination stations were established in a clinic area. The candidates rotated round each station at 3-min intervals. At each station they performed either a practical task or were asked to answer questions on material provided. Assessors were present at the stations where practical tasks were assessed and marked the candidates according to a score sheet which objectively defined the marks to be awarded for the performance of specific parts of the practical task.

The format of the exam could be adjusted to deal with varying numbers of students by including rest stations, and practical tasks requiring more than 3 min could be accommodated by duplicating the relevant stations. The types of station included are shown in Fig. 1 and a sample score sheet in Fig. 2.

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|------------|-----------------------------------|
| STATION 1 | Basic Life Support Test |
| STATION 2 | Application of broad arm sling |
| STATION 3 | Calculation of Glasgow Coma Score |
| STATION 4 | Suturing practical |
| STATION 5 | Initial trauma assessment |
| STATION 6 | Local anaesthetic toxicity |
| STATION 7 | Clinical photographs |
| STATION 8 | Burns fluid requirements |
| STATION 9 | Radiograph interpretation |
| STATION 10 | Toxicology data interpretation |

Fig. 1. Examination stations for A&E Medicine OSCE.

| | | |
|-----------------------------|------------|---------|
| 1. Check safety to approach | | 1 mark |
| 2. Check responsiveness | | 1 mark |
| 3. Opens airway | | 1 mark |
| 4. Checks for breathing | | 1 mark |
| 5. Check circulation | | 1 mark |
| 6. Mouth to mouth breathing | Good | 2 marks |
| | Average | 1 mark |
| | Poor | 0 marks |
| | No attempt | 0 marks |
| 7. Cardiac Massage | Good | 2 marks |
| | Average | 1 mark |
| | Poor | 0 marks |
| | No attempt | 0 marks |
| 8. Reassess circulation | | 1 mark |

Fig. 2. Scoring sheet for Basic Life Support station.

Multiple choice questionnaire (MCQ)

A multiple choice questionnaire consisting of 20, three-part questions with a true or false response was used. The incorrect answers were marked negatively.

Subjective assessment

The students were marked subjectively by two of their teachers on the basis of attendance, work presented to the group and performance of clinical work in the department. A score to a maximum of 10 was awarded. All students were marked by the same two teachers who had had regular contact with the students and were blind to the results of the other assessments. A mean mark was calculated from the two results and multiplied by 10 to allow comparison with the data from the OSCE and MCQ assessments.

Feedback

The students were asked informally for their opinions on the differing methods of assessment. The views of the examiners were also obtained.

Analysis

The marks obtained by the students in each form of assessment were compared by calculating correlation coefficients and testing these for significance.

RESULTS

A total of 27, 4th year medical students completed all three forms of assessment. The correlation of results is shown in Figs 3, 4 and 5 and the calculated correlation coefficients and the levels of significance in Table 1.

Although there was a tendency for positive correlation in all three comparisons this was weak

Table 1. Analysis of comparison of results from OSCE, MCQ and subjective testing

| | OSCE vs. Subjective | OSCE vs. MCQ | Subjective vs. MCQ |
|-------------------------|---------------------------|--------------------|--------------------------|
| Correlation coefficient | 0.58 | 0.33 | 0.35 |
| P | <0.01 | >0.05 | >0.05 |

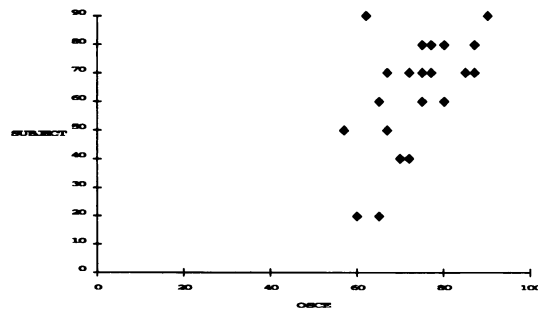


Fig. 3. Correlation of OSCE and subjective marking.

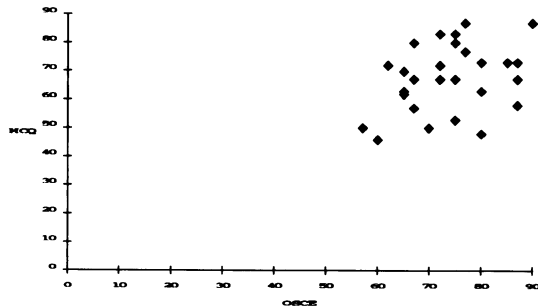


Fig. 4. Correlation of OSCE and MCQ marking.

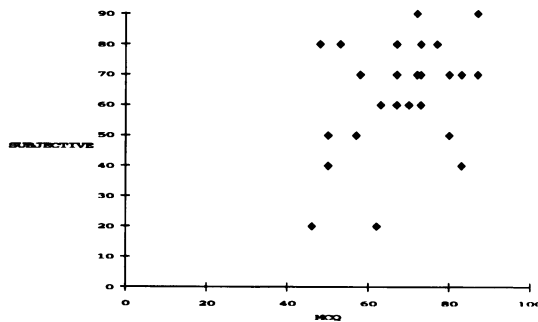


Fig. 5. Correlation of subjective and MCQ marking.

and only reached statistical significance in the comparison of OSCE and subjective results. We believe that this suggests that the OSCE gives us an objective measure of the qualities that we subjectively use to assess the clinical performance of medical students.

Feedback from the medical students suggested a high level of acceptability for the OSCE especially in comparison with multiple choice question format exams. The OSCE was generally perceived as being relevant and a fair test of the course. The students often found the practical skill stations stressful as they had never previously had to perform tasks in exams under direct observation from the examiners.

The examiners commented that the marks produced by the score sheet system sometimes failed to reflect the candidates overall performance on a task and there was some variation in opinion on the relevance of individual items in the exam. The OSCE format required greater effort in organization and an increased involvement in terms of staff on the day of the exam but this was generally viewed as worthwhile.

DISCUSSION

The OSCE has previously been used widely for assessing medical students and has been shown to be both valid and reliable compared with traditional forms of clinical assessment.⁸ Excellent levels of acceptance by both students and examiners over a prolonged period has also been demonstrated.⁹

We are not aware of the use of this type of assessment for undergraduates in A&E medicine elsewhere in the UK. The traditional format of clinical examination with long and short cases is impractical in A&E medicine where most patients have clinical signs which are painful and of brief duration. The format of the OSCE allows the examiners to control the content and complexity of the examination. In consequence we can move away from the testing of large volumes of factual knowledge to the assessment of practical skills such as Basic Life Support and suturing and to the examination of data interpretation and problem solving abilities. Further development of the exam may include the use of simulated patients to test history taking and physical examination.

The OSCE may prove to be equally useful in assessing postgraduates. Similar assessments are currently used in Advanced Life Support Courses and an OSCE is likely to form part of the examination for Fellowship of the Faculty of Accident and Emergency Medicine. A study in which A&E senior house officers are assessed using this method is currently in progress.

We feel that the OSCE gives an objective measure of the clinical skills that we try to teach during a medical student A&E medicine attachment and we have shown that the results from this exam correlate with the teachers perceptions of the abilities of their students. The OSCE encourages emphasis on learning practical skills rather than the acquisition from books and notes of large volumes of factual information and as such provides a suitable tool for the improvement of undergraduate education in A&E medicine.

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