A pilot study of the feasibility of trainee hospital doctors undertaking significant event analysis

Participating in significant event analysis is proposed as an important method of reflective learning that can enhance patient care and safety. Peer review is one way of making informed judgments on the ability of participants to apply the technique.

Introduction

The fundamental importance of clinical audit has been re-affirmed by its central role in the NHS clinical governance agenda and in the professional appraisal and revalidation of medical practitioners in the UK (Scottish Office, 1998; Scottish Executive et al, 2003). The emergence of significant event analysis (SEA) has added a new dimension to clinical audit (Pringle et al, 1995). The SEA technique enables an individual health-care professional or team to take a qualitative and structured approach to investigating single cases that are deemed to be significant, thereby facilitating the potential for learning or change (Stead et al, 2000).

A 'significant event' can be loosely defined as an occurrence or incident (good or not so good) that causes reflection or impacts on the quality of care or conduct of the health-care team. Subjecting these types of individual significant events to some level of scrutiny is important because there is great potential to gain valuable insights into quality and safety issues that are often missed or overlooked by conventional criterion audit method (Buckley, 1990).

SEA is in effect a synthesis of traditional case discussion and the scientific principles and philosophy underpinning the research-based critical incident technique (Flanagan, 1957; Bradley, 1992). Case discussion has a long tradition in medicine and is strongly recommended as an educational activity, but has been criticized when applied as a proxy for 'audit' (The Standing Advisory Committee for the Secretary of State for Health, 1990). However, the application of the SEA method of audit potentially overcomes the reliability problems inherent in these characteristically informal and unstructured discussions (Bradley, 1992).

The technique is now well-established in general medical practice, where many GPs and their teams are under external pressures to provide verifiable evidence of participation in the analyses of significant events for professional, contract and accreditation reasons (Scottish Executive et al, 2003; Scottish Executive, 2004; NHS Education for Scotland and Royal College of General Practitioners, 2005). However, the ability of GPs to potentially undertake SEA satisfactorily is variable (Bowie et al, 2003, 2004).

There is a growing expectation in the UK that verifiable evidence of individual professional performance will become a regulatory requirement for medical practitioners, but in which areas and by what methods has yet to be decided (General Medical Council, 2004). Despite reservations about submitting one's work for external evaluation (McIntyre and Popper, 1983), participation in peer review is increasingly seen as a valid method of critically appraising and making informed judgments on the performance of doctors by professional colleagues (Norcini, 2003). In the west of Scotland within general medical practice, a peer review model, based on educational principles, has been established, tested and developed for this purpose (Lough, 2003). One aim of the model was to promote SEA as part of continuing professional development and to act as a proxy indicator in determining if the analysis of a significant event by a GP is satisfactory or unsatisfactory.

The main purpose of this study was to introduce the SEA technique and the concept of voluntary assessment by peer review to a hospital setting. The aim in doing this was to determine the feasibility and potential of hospital-based trainees – preregistration house officers (PRHOs) and specialist registrars (SpRs) – to undertake an SEA. The ability of the trainees to assess by peer review their colleagues' SEAs was also explored.

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Methods

Study sample

The pilot study was conducted between August 2004 and January 2005 with two groups of hospital-based trainees who agreed to participate after discussion with relevant postgraduate tutors. The first group consisted of 15 PRHOs who worked in two large district general hospitals in the west of Scotland (Crosshouse Hospital, Kilmarnock and Inverclyde Royal Hospital, Greenock). The second group consisted of 10 SpRs attached to the west of Scotland higher surgical training scheme who were based in nine different hospitals across the region.

Data collection

SEA report format and method of peer review

Study participants used a standardized report format for SEA and a related peer assessment instrument, both developed and validated in west of Scotland general medical practice (Bowie et al, 2003; Lough, 2003). The purpose of the peer assessment instrument is to determine whether a SEA is satisfactory or unsatisfactory.

All trainees were required to submit a completed SEA report in strict confidence to one of the authors (JRM). An important part of a SEA involves the consideration or implementation of change. PRHOs were instructed to make a suitable suggestion for change in their SEA report because it was envisaged that they would be unlikely to influence or facilitate change as a result of inexperience and time factors. SpRs were expected to at least consider and justifiably rule out or, where appropriate, implement change as part of their SEA.

Immediate peer colleague review

SEA reports received by JRM were screened for anonymity issues. Each report was then forwarded to two other participants for peer review who scrutinized it and applied the assessment schedule to determine if it was satisfactory or unsatisfactory. For PRHOs, at least one of the two peer reviewers chosen was based in the other hospital, while for the SpRs all submissions were reviewed by peers working in another hospital.

Expert peer review

Simultaneously, all SEA reports received were externally and independently reviewed by two other individuals highly experienced in assessing SEA by peer review in the general practice setting (JM and PB) and also by JRM in order to identify any hospital medicine issues which may require later clarification. The three authors then met for joint discussion in order to agree a final outcome decision for each SEA report. The reasons for any SEA reports being judged unsatisfactory were also recorded so that this educational information could be disseminated to participants.

Education and training in the SEA technique and peer review

At the outset of this project, each group of trainees attended practical workshop training sessions in the SEA technique and educational peer review. The aforementioned standardized report format for SEA reports and the peer assessment instrument were also introduced at these sessions. Participants were able to practise their peer review skills using 'real life' SEA report examples from hospital and general practice medicine.

Results

Peer review outcome of SEA reports

PRHOs

In total 15 PRHOs submitted a single SEA report together with two completed peer review schedules for the SEA reports of two of their immediate colleagues, equating to a total of 30 peer reviews. A comparative summary of the immediate and expert peer review outcome data are illustrated in *Table 1*. Of the 30 peer reviews undertaken by immediate peer colleagues, 25 (83%) were judged to be satisfactory. In contrast, the outcome of the expert peer review process judged 6 of the 15 SEA reports (40%) to be satisfactory. Full agreement between immediate and expert peer reviewers occurred for a total of five SEA submissions (30%), all of which were judged to be satisfactory by both groups. The reasons for the nine SEA reports being deemed unsatisfactory by the expert peer reviewers are listed in *Table 2*.

SpRs

In total 10 SpRs submitted a single SEA report, together with two completed peer review schedules for the SEA reports of two of their immediate colleagues, equating to a total of 20 peer reviews. A comparative summary of the immediate and expert peer review outcome data is illustrated in *Table 3*. Of the 20 peer reviews undertaken by these immediate colleagues, 12 (60%) were judged to be satisfactory. The outcome of the expert peer review process judged 6 of the 10 SEA reports (60%) to be satisfactory. Full agreement between immediate and expert peer reviewers occurred for a total of four SEA report submissions (30%), three of which were judged to be satisfactory and one unsatisfactory by both groups. The reasons for the four SEA reports being deemed unsatisfactory by the expert peer reviewers are listed in *Table 4*.

Discussion

This small study set out to determine the feasibility of trainee hospital doctors participating in the SEA technique and related educational peer review. All study participants successfully identified a significant event as part of everyday medical practice, attempted a structured analysis of this event, and submitted a written report in standard format for assessment by peer review. In this respect the authors have demonstrated the potential feasibility of the SEA technique being undertaken in these groups of trainee doctors. Similarly, all participants also took part in the peer review of a colleague's SEA report.

The study contains a number of acknowledged limitations. The SEA report format and the peer assessment instrument were developed for general medical practice. Although the report format is used by senior house officers on

Table 1. Preregistration house officer significant event analysis reports judged to be satisfactory after peer and external review

Significant event analysis reports (n; %)	Satisfactory (n; %)	Unsatisfactory (n; %)
External peer reviewers (n=15)	6 (40)	9 (60)
Immediate peer colleagues (n=30)	25 (83)	5 (17)

% difference (95% confidence interval) =43% (15–71%), P= 0.003

Table 2. Areas of unsatisfactory event analyses by preregistration house officers identified by external peer reviewers as requiring improvement

Areas of significant event analysis report identified as requiring improvement*	n
Description of significant event	0
Reason(s) why significant event happened	7
Demonstration of insight and learning	1
Description of change proposed or implemented	2

* Multiple areas for improvement may have been identified

Table 3. Specialist registrar significant event analysis reports judged to be satisfactory after review by immediate and external peers

Significant event analysis reports (n; %)	Satisfactory (n; %)	Unsatisfactory (n%)
External peer reviewers (*n*=10)	6 (60%)	4 (40%)
Immediate peer colleagues (*n*=20)	12 (60%)	8 (40%)

Table 4. Areas of unsatisfactory event analyses by specialist registrars identified by external peer reviewers as requiring improvement

Areas of significant event analysis report identified as requiring improvement*	n
Description of significant event	0
Reason(s) why significant event happened	2
Demonstration of insight and learning	0
Description of change proposed or implemented	4

* Multiple areas for improvement may have been identified

GP vocational training schemes in the west of Scotland, it is possible that both it and the assessment instrument may not be entirely compatible with hospital medicine. The peer assessment instrument has been subjected to reliability and validity testing. However, evidence suggests that many existing instruments may need improvement in these areas (Evans et al, 2004). Another potential limitation is the relative unfamiliarity of hospital significant events by the expert peer reviewers, although an attempt to compensate for this was made by the inclusion in the review process of a senior hospital consultant.

Clearly with such a small study it is difficult to read too much into the findings, but the following issues may be worthy of comment. In terms of completing a satisfactory SEA as judged by expert peer review, both the PRHO and SpR groups had mixed successes. Although numbers were very small a slightly greater proportion of SEAs by SpRs were assessed as satisfactory compared with the PRHO group. The proportion of satisfactory SEA – as determined by peer review – by SpRs at around 60% is comparable to the findings in studies involving established GPs (Bowie et al, 2003). Although these studies involve much larger numbers it may point to the need for educational input on how to apply the technique and also that more experienced doctors are better able to undertake a SEA than less experienced colleagues.

There was variation in peer review outcomes between the two groups of trainees and between the trainees and the expert peer assessors. The level of agreement between the expert peer assessors was high. The need for joint discussion in order to reach an agreement on the assessment outcome for SEA reports only occurred in three cases for PRHOs and in a single instance for a SpR report. Assuming, therefore, that the outcomes arrived at by the expert reviewers were closer to the 'truth', this may reflect a need for more in-depth training and practice in undertaking peer review for trainees. Further research work involving larger studies would be required before a realistic judgment could be made on the ability of trainee doctors to peer review each other's work satisfactorily.

The reasons why an SEA is considered unsatisfactory may reflect a failure by some trainees, particularly the PRHOs, to fully recognize the underlying reasons and contributory factors to why an event occurred – something that has implications not only for reflective learning but also for clinical governance. In contrast, this was less so for the SpRs who had much more difficulty in terms of implementing change (or justifiably ruling it out), which is an acknowledged problem with SEA (McKay et al, 2003). The difference in being able to grasp an understanding of the causes of significant events that can occur in complex health-care systems may be a reflection of the maturity and experience of different grades of trainees.

Furthermore, there was an apparent reluctance to be constructively critical of the work of colleagues. Again this was particularly the case for the more junior trainees (the PRHOs). It is possible that the PRHO results reflect either a degree of apathy or a failure to fully understand the technique and/or assessment process, but clearly this is only speculation. The outcome may also have been affected by the PRHOs' relative lack of clinical experience to know what can and cannot be achieved. The SpRs did appear more prepared to label the work of colleagues as unsatisfactory but the results were still far from ideal. It appears that there is a need to stress that it is not a peer's clinical work that is being judged but their analysis of the event being reported.

The authors intend to build on this pilot study and further investigate the issues that have been raised. This includes the possibility of developing and testing a dedicated hospital-based SEA reporting format and peer assessment instrument. **BJHM**

KEY POINTS

- Significant event analysis (SEA) is a qualitative method of clinical audit that is well-established in general medical practice.
- The technique is increasingly applied as a surrogate for an individual or health-care team to reflect on and, where appropriate, change aspects of patient care.
- Peer review is proposed as one method of determining if an SEA report is satisfactory or unsatisfactory.
- Study participants were able to identify and analyse a significant event and submit details in a standard format for peer review as well as peer review a colleague's SEA.
- The outcome of the peer review undertaken by study participants varied from that determined by 'expert' peer reviewers.
- SEA may be a feasible technique that can be applied in hospital medicine by trainees.
- Trainees may be reluctant to critically appraise the SEA performance of colleagues.
- Further research would be required before a realistic judgment could be made on the ability of trainee doctors to undertake SEA and also peer review each other's work satisfactorily.

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IMAGES IN MEDICINE

Patent foramen ovale and paradoxical embolism presenting as acute coronary syndrome

A 46-year-old, male, cigarette smoker with a previous cryptogenic stroke presented with an inferior ST-segment elevation myocardial infarction (troponin T 1.47 ng/ml), and underwent immediate coronary angiography. This revealed normal epicardial coronary arteries and an embolic event was thought to be the cause of the acute coronary syndrome.

The patient was investigated with contrast transthoracic and transoesophageal echocardiography to exclude an intracardiac shunt. Injection of agitated saline via the right femoral venous route, taking advantage of the preferential direction of inferior vena cava flow towards the inter-atrial septum, demonstrated a large right to left shunt (>20 bubbles within three cardiac cycles) during spontaneous respiration, consistent with the presence of a significant patent foramen ovale. The patient was also noted to have an atrial septal aneurysm characterized by excessive septal wall motion (>15 mm excursion) during respiration (*Figures 1a* and *1b*).

Contrast echocardiography should be considered after any unexplained systemic embolism. **BJHM**

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Figure 1. Transoesophageal longitudinal view of intra-atrial septum (IAS) demonstrating the presence of a patent foramen ovale (PFO) and atrial septal aneurysm, (a) pre and (b) post contrast injection (LA=left atrium; RA=right atrium).