Post-hoc Analysis of Audience Responses-Enabled Conferences on Hematological Subjects

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Abstract

We have developed a strategy for the post hoc analysis of questions asked during audience response enabled conferences that objectively assesses baseline knowledge and comprehension of lectures. Examples of the application of this approach in training residents to manage hem/onc problems are discussed. Data from lectures on hem/onc emergencies and the interpretation of peripheral blood smears are presented. The demographics of knowledge in an audience consisting of medical students and residents at different level of training were demonstrated. Strengths and weaknesses in knowledge were identified. The data indicated that skills in managing hem/onc emergencies increased with the length of training but not in interpreting peripheral smears. Feedback indicated that participants were not intimidated by being tested. It is valuable to monitor knowledge during conferences since they usually review essential core information. The information derived from monitoring of conferences on hem/onc disorders can be used to optimize curriculum and training programs.

INTRODUCTION

Audience Response systems instantly display graphs of responses to questions during PowerPoint presentations. Therefore, this technology engages participants and encourages interactivity. Since lecturers can scan the graph of the responses, they are aware of audience comprehension and can spend more time on topics that were poorly understood (1-11).

Only a few published studies have objectively evaluated this technology, and the assessment has been limited to feedback (1-6), knowledge retention (7, 8) and program evaluation (11). The potential of in-depth post hoc analysis of audience responses during lectures has not been appreciated and investigated.

This paper describes a strategy that we developed for post-hoc analysis of audience response enabled lectures to assess the effectiveness of lectures and to determine baseline knowledge. This paper reports our experience with the post hoc analysis of two lectures on hematological subjects given to group of residents at different levels of training and medical students. The comparison of these lectures provided a way of testing the sensitivity of post hoc analysis.

Obtaining information using Audience Response Systems is less formal and less intimidating than standard testing, is easy to implement and can efficiently establish the demographics of baseline knowledge and identify strengths and weaknesses in knowledge. The application of this information for improving lectures, curriculum and training programs is discussed.

METHODS

CONTEXT

a)The study reports our experience using audience response systems in two lectures. The audience response enabled lectures were given at a medical center and the audience consisted of medical residents at different levels of training and medical students. Most of the residents and medical students had attended both conferences, but there were minor differences in the audience due to clinical rotations and involvement in clinical care. However, the distribution of participants at different levels of training was similar in both lectures.

b)One lecture was on hematologic emergencies that are clinical problems that residents frequently encounter during their training. The other lecture was on the interpretation of peripheral blood smears that is taught in medical school. However, blood smears are usually interpreted by clinical pathologists and the hematology laboratory and not by residents during their training program. The comparison of these lectures (one that has been emphasized and the other

that has not being emphasized during the medical residency training program) provided a means for determining the sensitivity of the post-hoc analysis for assessing the knowledge gained during the training program.

Questions were asked during PowerPoint presentations coupled with an audience response system. The audience responses to questions were instantly displayed (Turning Technologies, LLC). The rationale for correct answers was discussed.

a)Questions were asked in PowerPoint slides prior to the discussion of topics to establish baseline knowledge

b)Questions were asked after topics had been discussed in the lecture on morphology to test for comprehension of the presentation.

Since all responses were recorded, it was possible to carry out a post-hoc analysis of responses to questions.

a)Strengths and weaknesses in baseline knowledge were quantified.

b)The data was sorted according to level of training to obtain demographics of baseline knowledge and strengths and weaknesses in medical students and in residents at different levels of training (first, second and third year residents, PGY1, PGY2, PGY3, respectively).

c)Outstanding and poor grades in each demographic group were determined. The mean of grades plus one SD was used to identify outstanding performance. Conversely, the mean minus one SD was used to identify poor performance (12).

d)The comprehension of the lecture on morphology was evaluated.

Audience feedback about the value of using audience response systems during lectures was obtained by asking Likert questions in slides at the end of the PowerPoint presentations. Questions asked are shown in Table III.

RESULTS

Demographics of baseline knowledge:

Lecture on hematologic emergencies:

A more detailed analysis of this lecture was possible since there were 8 participants in each of 4 demographic groups (medical students, PGY1, PGY2 and PGY3 residents).

Figure 1 demonstrates that there were significant differences in grades between residents at different levels of training and medical students. Grades for medical students, PGY1, PGY2 and PGY3 in Hematology Oncology Emergencies were 39.5%, 48%, 54% and 68%, respectively. All differences in grades except those between PGY1 and PGY2 were significant (1 way ANOVA and Scheffe analysis). It is clear the baseline knowledge was proportionate to the length of training.

Figure 1

Figure 1: Demographics in baseline knowledge in the lecture on Hematologic Emergencies. PGY1, PGY2, PGY = 1ST, 2nd and 3rd year residents. STUD = Medical students. The illustration demonstrates that there were significant differences in grades between residents at different levels of training and medical students. Only the difference in grades between the grades of PGY1 and PGY2 were not significant. ANOVA and post-hoc Scheffe analysis were performed. (n=36)

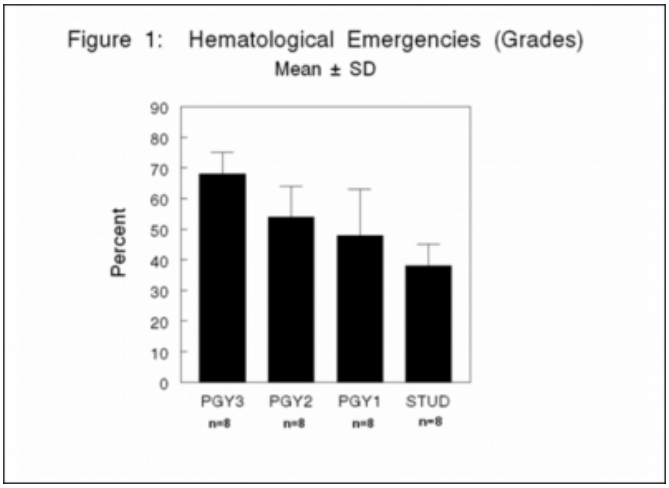

Table I demonstrates the results of the assessment for competency derived from the analysis of the data shown in Figure1. Outstanding grades were the mean grade plus one SD and poor grades were the mean grade minus one SD. Four of 8 PGY3 had outstanding grades and none had poor grades. Very few PGY1 and PGY2 had grades in the outstanding and poor grades. Four out of 8 medical students had poor grades and none had outstanding grades.