

The success of a weekly medical quiz. Test-based medical education

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ABSTRACT

Background: Clinical images and tests are considered useful tools to enhance the memorisation of facts and information in medical education. Therefore, we initiated a weekly medical quiz for our department of Internal Medicine.

Methods: Every week, a new case on a single slide with relevant information and a representative image, is sent by e-mail to staff, residents and others. All are requested on a voluntary basis to e-mail the presumed diagnosis within one week.

Results: After two years, 100 cases were presented to 452 registered participants. On average, only 33 of 452 (range 14 to 59) participants (7.3%; 95% CI 4.9 to 9.7) responded per case. Most presumed diagnoses were submitted on the same day the case was sent (OR 0.81; 95% CI 0.69 to 0.94; $p < 0.01$). Cases with a high response rate were associated with relatively more correct answers than cases with a low response rate. In addition, it was striking that participants in some subspecialties, particularly specialists in infectious diseases, were much more likely to respond to cases in their own subspecialty.

Conclusion: Our experience with a weekly medical quiz demonstrates rather low response rates. This could be due to time restraints, but could also be due to the fact that doctors do not like to be wrong, and are afraid to fail among their peers. Hence, although images and tests may be helpful learning tools, the success and contribution of such clinical-based quizzes to medical education are difficult to determine.

KEYWORDS

Clinical education, continuing medical education, problem-based learning, testing/assessment

INTRODUCTION

Clinical images and case-based material are considered to be efficient tools in medical education.^{1,2} Images aid in memorising facts and enhance the process of clinical reasoning. It has also been published that the use of tests promotes better retention of information.³ Therefore, some journals have created features using clinical images, such as 'Images in Clinical Medicine' in the *New England Journal of Medicine*, with an occasional query to test participants on their knowledge and learning. Images and tests also play an increasingly important role in Continuing Medical Education (CME), where credits can be earned by successfully completing accompanying quizzes. To exploit these theories, we initiated a weekly medical quiz for our department of Internal Medicine, which is part of a tertiary teaching hospital.

METHODS

We created a weekly medical quiz, presented on a single slide that contains all relevant information and a representative image. Every Monday during the department's morning report, a new case is presented and the diagnosis, including a short explanation of the previous case, is given. In addition, the case is sent by e-mail to staff, residents and others who expressed interest (e.g. researchers, interns, students). All are requested on a voluntary basis to submit the presumed diagnosis within one week by e-mail to one of us (GEL). Cases encompass the broad spectrum of general internal medicine and its subspecialties, and are obtained from our own institution and local training hospitals.

Table 1. Relative response ratios of subspecialists on cases in their own speciality

Subspecialty	Number of cases on subspecialty	Number of participants registered with subspecialty	Relative response ratio on cases in own subspecialty*
General internal medicine	21	66	2.4
Endocrinology	12	13	2.7
Haematology	6	15	0.8
Infectious diseases	21	25	4.4
Gastroenterology	7	7	0.6
Nephrology	4	13	0.4
Rheumatology	8	9	1.2
Vascular medicine	2	26	0.3
Cardiology	6	9	0.9
Intensive care medicine	2	8	0.4
Oncology	6	11	0.8

*Calculated as ratio of response on cases in own subspecialty to total response of participants within the specific subspecialty (with exclusion of general internal medicine cases in all other subspecialties).

RESULTS

After two years, we have presented 100 cases to 452 registered participants. On average, only 33 of 452 (range 14 to 59) registered participants (7.3%; 95% CI 4.9 to 9.7) responded per case. Response levels per participant varied from one to almost all cases (range 1 to 81), while residents proved to be more loyal participants than members of staff. Of all response, 46% was submitted by residents, 35% by staff members and the remainder by others. Most presumed diagnoses were submitted on the same day the case was sent (OR 0.8; 95% CI 0.7 to 0.9; $p < 0.01$). Staff members submitted a correct diagnosis in 61.2% of cases, as did 56.3% of residents. Cases with a high (≥ 40 respondents) and low (< 25 respondents) response rate were compared. This demonstrated that cases with a high response rate were generally associated with a higher percentage of correct answers (mean 63.8%; range 20.0 to 100%) than cases with a low response rate (mean 45.0%; range 0.0 to 87.5%).

For 202 of 452 participants (44.7%), a subspecialty was registered. It was striking that in some subspecialties, participants, both residents and staff, were much more likely to submit answers for cases in their own subspecialty (table 1). Specialists in infectious diseases serve as an example: they were almost five times more likely to respond to infectious diseases cases than to others.

DISCUSSION

Case-based images and tests may be useful tools in medical education and the training of Internal Medicine, by direct recognition of clinical diagnoses. However, our experience with a weekly medical quiz also demonstrates that interaction is limited due to rather low response rates.

This could be due to time restraints, but could also be explained by the fact that our participants do not like the possibility of being wrong. This hypothesis is supported by the observation that participants were more likely to submit answers on the same day they received the case, and to cases concerning their own subspecialty. In addition, cases with a high response rate were associated with a relatively higher number of correct answers than cases with a low response rate, possibly reflecting the difficulty of the case. Apparently, participants are more likely to submit a diagnosis if they are (more) convinced of having the correct answer. It is therefore tempting to conclude that doctors are afraid to fail among their peers. Yet, these observations also hinder in determining the success and contribution of such clinical case-based quizzes to medical education.

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