

Assessment of skills of performing benzidine test among II MBBS students

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Abstract

Background: A mandatory and desirable comprehensive list of procedural skills has been planned and recommended for medical students during their MBBS course and benzidine test is one among them.

Aim: To assess the technical skills of 38 II MBBS students by asking them to perform a simple laboratory benzidine test on a given sample of urine.

Methods: The technical skill assessment was done by the pathology faculty by using a predetermined checklist.

Results: The desirable test result was obtained by 86.84% of students. The students showed carelessness in handling benzidine powder due to their negligence.

Conclusion: The students need to be emphasized on the importance of skill in performing this test and safety measures in lab practice.

Key words: Psychomotor skill assessment, benzidine test, laboratory safety.

Introduction

Evaluation of psychomotor skills of medical students is one of the necessary step in the assessment of learning. The development of procedural knowledge and the ability to perform the technical tasks requires observation and practice and the assessment method adopted should be valid. Objective structured practical examinations are the most common methods of assessing procedural skills which utilise predetermined checklists in this assessment format.¹ Undergraduate trainees have to learn and perform a wide range of procedures during their MBBS course and chemical examination of urine is one among them. In this study assessment was done on a routinely performed simple laboratory procedure of benzidine test which detects the presence of blood in urine

The present study was undertaken to assess the procedural skills of undergraduate medical students in performing benzidine test on a given sample of urine

Methodology

In the present study, we analysed the technical practical skills of the 38 undergraduate medical students who were slow learners and required 2 to 3 attempts to clear their I MBBS examinations. Each

student was asked to perform benzidine test to detect hematuria. The students were given prior instructions and demonstrations about the procedure of benzidine test and then they were observed while performing the test. A detailed checklist was prepared consisting of 7 task steps to be assessed. The checklist was reviewed by faculty members of the Department of pathology. All observers were provided with the predetermined checklist before performing the test. The following checklist was used.

1. Whether the student measured exactly 2 ml of glacial acetic acid?
2. Was pinch of benzidine powder added?
3. Was the benzidine powder added by using a spatula?
4. Was the handling of benzidine powder careful or careless?
5. Did they add exactly 2 ml of hydrogen peroxide?
6. Did they add exactly 2ml of urine next?

The assessment of the practical skill examination was followed by an interactive session discussion regarding the mistakes done by the students and about the rectification of the same.

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Table 1: Assessment of students in appropriate performance of the test

Observations	Measured exactly 2 ml of 10% glacial acetic acid	Added a pinch of benzidine powder	Used a spatula	Carefully handled benzidine powder	Added exactly 2 ml of hydrogen peroxide	Added exactly 2ml of urine
No of students (n=38)	31 (81.6%)	35 (92.1%)	35 (92.1%)	31 (81.6%)	33 (86.84%)	33 (86.84%)

Results:

II MBBS refresher batch consisted 47 students out of which 38 (80.85%) attended the practical demonstration class. Of these 24 were males(63.16%) and 14(36.84%) were females.

A total of 31 students (81.6%) could exactly measure 2 ml of glacial acetic acid. 35 students (92.1%) added a pinch of benzidine powder by using a spatula. 31 students(81.6%) were able to handle benzidine powder carefully as per the instructions given and 33 students(86.84%) could exactly measure 2ml of hydrogen peroxide and urine and add to the test tube. All the students observed for the color change and desirable test result was obtained by 33 students (86.84%).

Discussion :

Procedural skill competency is a central requirement of pathology training. Acquiring the psychomotor skills require observation, imitation and practice. One way of teaching skills is the four step approach suggested by Rodney Peyton of the Royal College of surgeons which constitutes demonstration, deconstruction, comprehension and performance. This ensures the teachers to break the process into manageable steps, asks the learners to vocalize the steps, provides repetition to reinforce learning and correct mistakes.²

Chemical examination of urine is routinely performed laboratory test which has implications on patients diagnosis and management and therefore competency is required to perform the test to obtain accurate result. In the present study a 7 students failed in adding the desirable amount of glacial acetic acid and 5 students did not add the desired amount of hydrogen peroxide and urine in the test tube probably due to their negligence. The desirable test result was obtained by 33 students (86.8%).

Benzidine dyes and related compounds are hazardous and potent carcinogens and their exposure through

dermal and respiratory contact is known to cause bladder cancer³. It is necessary for the students to understand the chemical laboratory hazards and the protection measures.⁴ In spite of being repeatedly instructed, 3 students did not use spatula for benzidine powder and bare handled it and 7 students carelessly handled it. This can be attributed due to the lack of proper knowledge regarding lab safety.

Conclusion :

Laboratory skill assessment is mandatory under undergraduate medical education. A reliable tool selection for assessment of skill is very important. Assessment not only assists in assessing the performance of students but also provides a feed back to the teacher and enables to focus on the areas that need additional attention. This study not only gave us an opportunity to assess the skill but also made us to know that the students should not be exposed to such hazardous chemicals and this benzidine test should be banned by the medical colleges and has to be replaced by other methods. The students need to be emphasized about the importance of performing laboratory procedures accurately with proper interpretation of the results. The students also needed to be emphasized on the chemical laboratory hazards and safety measures in laboratory practice.

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