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Evaluation of Diagnostic process in Oral Surgery Department

A cross-sectional Study for 5th Year Dental Students at Mustansiriya University

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Abstract

Introduction: Diagnosis is one of the important skills for dental students. During their clinical training dental students make diagnostic mistakes, which are expected because of limited knowledge and experience. Despite the fact that these diagnostic problems are usually addressed during the clinical training in the final two years, the exact reasons for diagnostic inaccuracies made by students have not been investigated thoroughly in Iraqi dental schools.

Aim: The aim of the study is to identify factors influencing the appropriateness of diagnostic procedure by students performing dental extraction.

Material and methods: Eight Selected items from the case sheet of the Department of Oral Surgery were used to evaluate the student's accuracy of surgical diagnosis. Seventy eight dental students were included in the study. After completion of surgical (dental extraction) procedure, each student was asked about the reason behind the diagnosis.

Results: Documentation of selected items reported as follows: chief Complaint (CC) field was neglected in 9%; history of present illness has been neglected in 73 case sheets (93.6%). Chi square test, however, showed no significant relationship between history taking (CC and HPI) and the accuracy of diagnosis. Extraoral clinical examination included lymph node (LN) examination, which was reported in 42 cases (53.8%); and facial swelling, which has been reported in 45 (57.7) cases. Intra oral examination items reported as follows: cavity probing was documented in 33 (42.3%) cases; tooth percussion for tenderness documented in 50 (64.1%) cases; examination for tooth supporting structure reported in 46 (59%) cases. Chi Square Test did not show significant relationship between both extra and intra oral examination and the accuracy of diagnosis ($p>0.05$, $df=12$). 56 students, however, made their diagnosis by guess rather than accurate diagnosis process. How about the differences you observed by gender?

Conclusion: There is an obvious lack of documentation in both history taking and clinical examination. This might negatively influence proper diagnostic procedure.

Keywords: Dental Students, Diagnostic Procedure, History Taking, Intra-Oral Examination and extra-oral examination

Introduction

The Clinical teaching process represents an interactive environment between the student, patient and clinical trainer. This environment helps the students to acquire the proper clinical skills (Groenlund and Handal, 2013). Teachers and researchers in the past decade have discussed

how to improve clinical learning abilities within this environment, which results in continuous review of dental curricula (Sodestorm et al., 2012) (Albino et al., 2008; de-Azevedo-Vaz et al., 2013; Fincham and Shuler, 2001; Hendricson et al., 2006). Oral diagnosis is one of the important skills for dental students

(Trowbridge et al., 2013). It is the skill dentists need in every aspect of their clinical practice. Management and treatment planning mandate accurate diagnosis. Performing diagnosis involves range of systematic procedures which aid in diagnostic decision making (Hendricson et al., 2006; Pretty and Maupome, 2004).

Gordon et al divided diagnosis process into seven steps: (1) presentation, (2) history taking, (3) clinical examination, (4) testing, (5) assessment, (6) referral, and (7) follow-up (Schiff et al., 2005). This will provide the dental student the skill of clinical reasoning, as recent perspective in medical education is to prepare successful clinician through effective knowledge management (Graber et al., 2009).

The major goal of clinical trainer is to teach the student to follow the accurate diagnostic steps, to help him/her acquiring necessary knowledge and clinical problem solving skills, in addition to ensuring professional behaviour (Cox et al., 2010) (John H. Klefner, 2007).

During their clinical training dental students make diagnostic mistakes, which is expected because of limited knowledge and experience (Graber et al., 2009). In fact diagnostic errors are often committed by medical residents and practitioners in general, which may reach up to 15 % (Graber, 2013; Schiff et al., 2005; Schiff et al., 2009; Singh et al., 2014; Trowbridge et al., 2013).

Each clinical department in the College of Dentistry- Mustansiriya University, including Oral Surgical Department, provides students with patient case sheet, in which he/she documents the case history and clinical findings. This protocol aims to help the student to reach the precise diagnosis and informed treatment decision. Part of the task of the clinical trainer in the department is to spot errors in the steps to reach diagnosis and treatment process (Berner, 2009) (Hendricson et al., 2006).

Despite that teaching process received more attention in the re-

cent years, there was no particular emphasis on diagnostic errors (Singh, 2013). Diagnostic inaccuracies continue to represent a challenge for dental students, especially in their final study year. Despite the fact that these diagnostic problems are usually addressed during the clinical training in the final two years, the exact reasons for diagnostic inaccuracies made by students have not been investigated thoroughly in Iraqi dental schools.

Aim

The aim of the study is to identify factors influencing the appropriateness of diagnostic procedure by students performing dental extraction.

Materials and methods:

This study has been approved by Mustansiria Dental College Scientific Committee. This study was conducted at the Department of Oral Surgery, College of Dentistry, Al-Mustansiria University/ Baghdad during the first three weeks of the academic year 2014-2015.

Selected items from the case sheet of the Department of Oral Surgery were used to evaluate the student's accuracy of surgical diagnosis. These items were:

A-Case history

- 1- Chief complaint.
- 2- History of present illness.

B-Extra-oral examination which includes:

- 1-Lymph nodes examination.
- 2-Swelling (if present).

C-Intra-oral examination

- 1-Probing of the accused tooth.
- 2-Percussion of the accused tooth (lateral and vertical).
- 3-Tooth supporting structures (gingiva, periodontal ligaments, alveolar bone).

These items were chosen because they were directly related

to diagnosis of accused tooth condition. Other items are related to patient's medical history and other teeth conditions.

D- Investigations, which has not been considered for statistical analysis as it was not required in most of the referred cases for extraction.

Each answered item scored 1, not answered or incompletely answered scored 0. Correct diagnosis scored 2, correct diagnosis by guess scored 1, wrong diagnosis scored 0.

If the student did not write the result of the examination, the score was also scored 0.

Each case sheet was reviewed and diagnosis was assessed before starting the extraction procedure. After completion of surgical procedure (dental extraction), each student was asked about the reason behind the diagnosis. Certain cases the students had already made a diagnosis in their mind, in retained roots cases in particular. Hence they skipped the required steps to reach the diagnosis, these cases were given a score 1 for diagnosis by guess. Seventy eight dental students were included in the study. The sample size was determined by the number students in the 5th class. Statistical analyses were performed by SPSS version 20. As study variables are nominal variables Chi square test was performed to determine the statistical relationship.

Results

Seventy eight dental students from the fifth year participated in this study. Twenty six (33.3%) of participating students were males and 52 (66.7%) were females. Chi-square test showed no significant relationship between accuracy of diagnosis and the sex of student ($p > 0.05$, $df = 2$).

Seventy eight patients participated in this study, 53 (77.9%) patients were referred from the Prosthodontic Department for extraction of either retained roots, or for extraction of single isolated teeth interfering with denture construction. The remaining 25 (32.1%) patients were referred from Oral Diagnosis Department for unrestorable teeth.

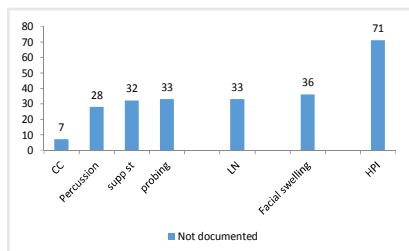


Figure 1: Documentation for history taking and clinical examination (n=78)

Figure 1 demonstrates a general trend of inadequate documentation of relevant information fields in the case sheet. Apart from Chief Complaint (CC) field where only 9% of the cases were empty, most the remaining relevant case sheet items exhibited noticeable lack of information, ranging from 28 (35.9%) to 36 (46.2%) of the cases. History of present illness (HPI) has been neglected in 73 case sheets (93.6%). Only 5 case sheets (6.4%) documented information regarding HPI. Chi square test, however, showed no significant relationship between history taking (CC and HPI) and the accuracy of diagnosis.

Relevant extraoral clinical examination involved documentation of lymph node (LN) examination and the presence of facial swelling with comparable percentage of record. LN examination was reported in 42 cases (53.8%) leaving 36 cases with no documentation. Facial swelling item has been reported in 45 (57.7) cases. Intra oral examination items also showed noticeable levels of

negligence in documentation, as follows: cavity probing was documented in 33 (42.3%) cases; tooth percussion for tenderness documented in 50 (64.1%) cases; examination for tooth supporting structure was reported in 46 (59%) cases. Five patients (6.4%) required additional investigations. These cases required periapical radiographs to confirm

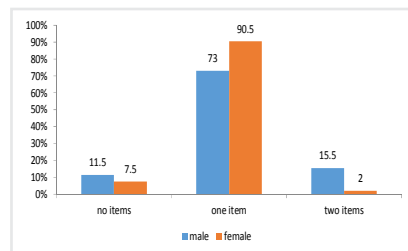


Figure 2 the percentage of documentation of case history items by male and female students.

the diagnosis. Chi Square Test did not show significant relationship between the degree of documentation for both extra and intra oral examination and the accuracy of diagnosis ($p > 0.05$, $df = 12$).

Figure 2 shows the degree of documentation for the items of case history (two items) between

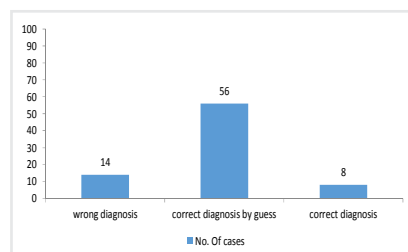


Figure 3 the percentage of documentation of clinical examination items by male and female students

male and female students. There is relative difference in the degree of documentation for related question about the case history. Female students are keener to document the information than male students. The difference is more obvious in HPI item. This

has been statistically confirmed by Chi square test ($P < 0.05$, $df = 2$). It is obvious from Figure 3 that male students involved in clinical examination more than female students, apart from the examination of tooth supporting structure. The most obvious difference is noticed in tooth probing which was only performed by 25% of female students compared to about 77%

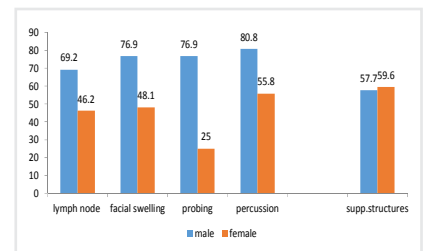


Figure 4: diagnostic accuracy for the study sample (n=78)

of male students who performed the test. There was a significant relationship ($P < 0.01$, $df = 6$) between the sex of the student and the clinical examination (intra and extraoral items)

Figure 4 reveals the level of accuracy in diagnosis for the collected sample. The majority of the students (71.8%) reached the diagnosis by guess. 14 students (17.9%) made the wrong diagnosis. Only 8 (10.3%) students reached the correct diagnosis through following the accurate clinical reasoning process.

Discussion

The instrument used to assess students' clinical skill is the patient case sheet. The reason for choosing Oral Surgery Case Sheet is that it represents the most comprehensive case sheet in the dental school. It has 56 items (questions) covering current and past dental history; both extra and intra oral examination, medical history, family history and habits.

Reaching clinical diagnosis is a

culminate process of information gathering from patient's interview and clinical examination as agreed in most dental curricula. Inaccuracies or deficiencies in following clinical diagnostic protocol with misinterpretation of provided information might lead to wrong treatment decision (John et al., 2012). On the other hand proper history taking and examination with accurate report of collected information help the student in his clinical reasoning process to reach accurate diagnosis, especially for beginner dentists (Crespo et al., 2004).

As the study results suggest, most of the students have reached the accurate diagnosis. However, Most of these diagnostic decisions were by guess, since most of the cases are referred for extraction of teeth for prosthetic reasons. Such cases are presented with retained roots, which are mostly diagnosed as teeth with chronic periapical lesions.

Despite the fact it has been stressed by the academic teaching staff that proper case sheet documentation is essential, it seems that students try to save time by neglecting proper registration of information. Saving this time, as students explain to the researchers, helps to increase the number of dental extraction to achieve the requirement for the final exam entry. The second reason for this negligence could be that students are more concerned about the technical aspects of dental extraction procedure rather than reporting the history and clinical findings, even when these students are in the 5th year and they should have gained some confidence from the dental extraction procedures they performed during the 4th year. However, some of them might not be sure about their technical extraction skills.

Graber et al found that students

commit cognitive errors, such as failure to gather adequate history information or perform proper physical examination (Graber et al., 2009). This agrees with the finding of this study. However, this study data suggests that proper history taking and documentation is not necessarily related to correct diagnosis. This could be explained by the fact that most of the cases which have been referred from prosthodontic department for extraction of retained root are diagnosed based on prejudice judgement. Students are taught by their clinical tutor that asymptomatic retained roots are almost always diagnosed as chronic periapical lesions. For such cases, students usually jump to diagnosis ignoring proper patient interrogation and clinical examination.

Majority of published studies about diagnostic errors belong to the medical field, whereas there is paucity of studies concerning dental field. It might be expected that some level of difference in diagnosis and treatment planning between the two disciplines (John et al., 2012). However, this study's results agree with the fact that mistakes in clinical reasoning process in both disciplines may result from inadequate data collection and interpretation (Graber, 2013).

It seems that students in this study sample are not fully aware of the importance of proper case sheet filling. This in turn could negatively influence the organisation of ideas with missing the clinical key message provided by the clinical findings. This in turn will jeopardise their diagnostic procedure (Crespo et al., 2004).

It should be remembered, however, that the number of case sheet items might represent a burden for the student. Intra and extra-oral examination items in the current case sheet in Oral Surgery

Department are 22. Nine items in the case sheet are dedicated for extra-oral examination, whereas 13 items are devoted for intra-oral examination. In addition there are 8 items specified to detect dental problems including: missing teeth, fillings, carious teeth, calculus, retained roots, bridges, crowns and defected fillings. Such a number of items for students in the clinic has its burden, especially, if we consider that students' main concern is to master different local anaesthesia and extraction techniques. This could be another reason for only 2 (2.6 %) students completed the chosen fields in the case sheet, which is an important finding that needs considerable attention.

The study results not only revealed a lack of students' enthusiasm to report their clinical findings, but also showed a difference between male and female students concerning the case sheet filling details. There are published studies that found certain differences between men and women clinical performance in general, especially in their attitude toward risky tasks (Park et al., 2010).

A comparative study between male and female dental students in Jordan found that female students are better in the theoretical than clinical courses. In Oral Surgery, however, the study did not find significant difference between both genders (Sawair et al., 2009). These findings refer to the fact that female students are more theoretically oriented in general; whereas male students are better in manual aspects of practice (do you have a reference to support this?). This might explain to some extent the current study results. As the study data suggests, female students seem more interested in verbal communication with the patients than male students and reluctant to be manually involved in clinical examination during the

diagnostic process compared to their counterpart male students. This, certainly, represents a problem in clinical training, as it is important to integrate theory and practice in dental clinical education (Crespo et al., 2004; Kelleher, 2014).

To address this problem it might be suggested to teach students a time saving strategy or to reduce the number of case sheet items. It could be suggested to address this problem by either teaching student a time saving strategy for case sheet filling, or reducing the case sheet fields to help students to focus on more important aspects of patient's information. The clinical trainer, in addition, can use these findings to direct students' attention during clinical demonstration to this problem. Training process needs to encourage each student to avoid the expected error in his/her diagnostic performance.

Clinics are challenging environment for the student and the trainer as well. There is a diversity of theoretical, clinical competencies and ethical behaviour for students to demonstrate (Gerzina et al., 2005). Improper case sheet filling seems to represent a trend in students' behaviour. It does not, necessarily, mean that students do not ask, but it might reflect students' unwillingness to fill out every field in the case sheet paper.

The main shortcoming of this study is the number of male students, which was the total number of male students in 5th year. This may affect the power of statistical analyses. It however, reflects the tendency toward feminisation of dentistry in general (Silva et al., 2010), as the number of female students always dominates male number in Iraqi dental schools.

The findings of this study raise an important question about students' attitude about patient's case sheet and its role in establishing proper

diagnosis. This will be addressed with a qualitative study. It is hoped that this study will provide the teaching staff with possible tactics to improve diagnostic process performed by dental students.

Conclusion

There is an obvious lack of documentation in both history taking and clinical examination. This might negatively influences proper diagnostic procedure.

References

Albino JE, Young SK, Neumann LM, Kramer GA, Andrieu SC, Henson L, et al. (2008). Assessing dental students' competence: best practice recommendations in the performance assessment literature and investigation of current practices in predoctoral dental education. *J Dent Educ* 72(12):1405-35.

Berner ES (2009). Diagnostic error in medicine: introduction. *Adv Health Sci Educ Theory Pract* 14 Suppl 1(1-5).

Cox SM, Goepfert A, Hicks P, Clinchot DM, Lynn DJ (2010). Working with Students with Difficulties: Academic and Nonacademic In: R-ME Fincher editor: Rutgers University.

Crespo KE, Torres JE, Recio ME (2004). Reasoning process characteristics in the diagnostic skills of beginner, competent, and expert dentists. *J Dent Educ* 68(12):1235-44.

de-Azevedo-Vaz SL, Vasconcelos KdF, Rovaris K, Ferreira NdP, Neto FH (2013). A survey on dental undergraduates' knowledge of oral radiology. *Braz J Oral Sci.* 12(2):109-113.

Fincham AG, Shuler CF (2001). The changing face of dental education: the impact of PBL. *J Dent Educ* 65(5):406-21.

Gerzina TM, McLean T, Fairley J (2005). Dental clinical teaching:

perceptions of students and teachers. *J Dent Educ* 69(12):1377-84.

Graber ML, Tompkins D, Holland JJ (2009). Resources medical students use to derive a differential diagnosis. *Medical Teacher* 31 (522-527).

Graber ML (2013). The incidence of diagnostic error in medicine. *BMJ Qual Saf* 22 Suppl 2(ii21-ii27).

Groenlund C, Handal B (2013). Contemporary Issues in Clinical Dental Training. *The Journal of Contemporary Dental Practice* 14(3):501-510.

Hendricson WD, Andrieu SC, Chadwick DG, Chmar JE, Cole JR, George MC, et al. (2006). Educational strategies associated with development of problem-solving, critical thinking, and self-directed learning. *J Dent Educ* 70(9):925-36.

John H. Kleffner EDaWDH (2007). *Effective Clinical Teaching*. Texas: The University of Texas at Austin College of Pharmacy.

John V, Lee S-J, Prakasam S, Eckert GJ, Maupome G, Eckert GJ, et al. (2012). Consensus Training: An Effective Tool to Minimize Variations in Periodontal Diagnosis and Treatment Planning Among Dental Faculty and Students. *Journal of Dental Education* 77(8):1022-1032.

Kelleher M (2014). Current controversies in training and/or education of dentists in the UK. *Br Dent J* 217(9):497-8.

Park S, Silva JD, Barnes J, Susarla S, Howell T (2010). Predicting dental school performance based on prior dental experience and exposure. *Eur J Dent Educ.* 14(1-6).

Pretty IA, Maupome G (2004). A closer look at diagnosis in clinical dental practice: part 1. Reliability, validity, specificity and sensitivity of diagnostic procedures. *J Can Dent Assoc* 70(4):251-5.

Sawair FA, Baqain ZH, Al-Omari IK, Wahab FK, Rajab LD (2009).

Effect of Gender on Performance of Undergraduate Dental Students at the University of Jordan, Amman. *Journal of Dental Education* 73(11):1313-1319.

Schiff GD, Kim S, Abrams R, Cosby K, Lambert B, Elstein AS, et al. (2005). Diagnosing diagnostic errors: Lessons from a multi-institutional collaborative project.

Schiff GD, Hasan O, Kim S, Abrams R, Cosby K, Lambert BL, et al. (2009). Diagnostic error in medicine: analysis of 583 physician-reported errors. *Arch Intern Med* 169(20):1881-7.

Silva ETd, Nunes MdF, Queiroz MG, Leles CR (2010). Factors Influencing Students' Performance in a Brazilian Dental School. *Braz Dent J* 21(1):80-86.

Singh H (2013). Diagnostic errors: moving beyond 'no respect' and getting ready for prime time. *BMJ Qual Saf* 22(789-792).

Singh H, Meyer AN, Thomas EJ (2014). The frequency of diagnostic errors in outpatient care: estimations from three large observational studies involving US adult populations. *BMJ Qual Saf* 23(9):727-31.

Sodestorm T, Hall L, Nilsson T, Ahlqvist J (2012). How Does Collaborative 3 D Screen Based Computer Simulation Training Influence Diagnostic Skills of Radiographic Images and Peer Communication. *Contemporary Educational Technology* 3(4):293-307.

Trowbridge RL, Dhaliwal G, Cosby KS (2013). Educational agenda for diagnostic error reduction. *BMJ Qual Saf* 22 Suppl 2(ii28-ii32).