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Application and Feasibility Analysis of Various Teaching Methods in ECG Teaching of Arrhythmia

Xie Chunlin[1,a], Zhang Songwen[1,b,*]

[1]The Second People's Hospital of Hefei, Hefei, China
[a]felinae_xie@foxmail.com, [b]pinasterecg@yeah.net
**Corresponding author*

Abstract: *Objective: To analyze the application effect of traditional and diversified teaching methods in ECG teaching of arrhythmia and judge its feasibility. Methods: A total of 800 interns rotating in our department from January 2015 to December 2020 were selected and divided into control group (n = 400) and study group (n = 400) by convenient sampling.The traditional teaching method was used in the control group, while the diversified teaching method was used in the study group.Comparison between groups :(1) theoretical test scores and operational skills scores;(2) students' satisfaction with teaching. Results: The scores of operational skills of interns in the study group were (90.77±9.02) and (88.46±7.34), which were higher than those in the control group (79.82±8.12) and (70.33±6.25), with statistical differences (P < 0.05). The total satisfaction rate of teaching in the study group (96.75%) was higher than that in the control group (90.75%), and the difference was statistically significant (P < 0.05). Conclusion: Diversified teaching method has a significant application effect and high feasibility in teaching arrhythmia electrocardiogram.*

Keywords: *Teaching method; Arrhythmia; Electrocardiogram (ECG); Teaching; Application effect; The feasibility of ECG Teaching*

1. Introduction

Electrocardiogram (ECG) is one of the methods for the clinical diagnosis of diseases, and it is a diagnostic skill that clinicians must master. It has positive value in the diagnosis and analysis of arrhythmias. The characteristic changes and evolution of electrocardiograms are reliable and practical methods for the diagnosis of myocardial infarction. It can help clinical diagnosis of atrioventricular hypertrophy, myocardial injury, myocardial ischemia, pericardial diseases, drug influence and electrolyte disturbance. Ecg sampling, analysis and diagnosis are the basic skills that every intern needs to master. However, the theoretical knowledge of ECG teaching in the past is too abstract and obscure, and the waveform of ECG is various and complex, which is difficult to remember. Although many interns have learned the theory of ECG, they still cannot fully understand the principle of ECG, cannot understand ECG in clinical work, and cannot accurately identify arrhythmia and other conditions [1-2]. Therefore, the department of electrocardiology should improve the teaching method of the electrocardiogram. Instead of adopting the model of "learning theory first, then practising" for interns, it should combine various teaching methods to improve the teaching quality of electrocardiograms through diversified teaching methods [3]. In this paper, 800 interns rotating in our department from January 2015 to December 2020 were selected to analyze the application effect of traditional and diversified teaching methods in ECG teaching of arrhythmia and to judge its feasibility.

2. Methods and Data

2.1. Study Subjects

A total of 800 interns rotating in our department from January 2015 to December 2020 were selected and divided into control group (n = 400) and study group (n = 400) by convenience sampling. Study group: 187 males and 213 females; There were 187 males and 213 females with an average age of (21.97±4.24) years (range 18-24 years). Education level: college in 123 cases and undergraduate in 277 cases. Control group: 181 males and 219 females; The average age was (21.66±4.28) years (range, 19-23 years). Education level: college degree in 129 cases and bachelor degree in 271 cases. The average

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age, male and female distribution, and education level were included in the comparison between groups ($P > 0.05$), and statistical comparison could be taken between the two groups.

Inclusion criteria: (1) no systematic training experience such as electrocardiogram recognition before teaching; (2) The same learning ability; (3) the same courses taken; (4) the same teaching hours as the lecturers; (5) all students are full-time students; (6) All subjects gave informed consent to the study. Exclusion criteria: participants who were unable to participate in important aspects of the study due to various reasons.

2.2. Methods

Control group using traditional teaching method, teachers according to the syllabus for a specific lesson plans, 2 hours each week or so the theory of teaching, teaching means for the multimedia video, teaching content mainly includes the principle of electrocardiogram (ECG) and the significance of the related parameters of electrocardiogram (ECG) and, arrhythmia, myocardial ischemia and myocardial infarction (mi), electrocardiogram (ECG) performance characteristics of atrioventricular hypertrophy, electrolyte disorder [4]; Six hours of practice teaching were conducted every day. The teachers led the interns to connect and sample electrocardiogram in the clinic and analyzed and explained the electrocardiogram combined with the patient examples, so as to improve the theoretical level and practical ability of the interns. After the teaching, the teacher assessed the interns and analyzed and explained their shortcomings.

The research group adopted diversified teaching methods: (1) adjusting the order of teaching outline, teaching according to the actual work required in (2) teachers can be ECG EEG, EEG, ECG teaching practice and theoretical teaching together, interns study immediately after practice, can be faster to integrate theory with practice, thus a deeper understanding of relevant knowledge, the more skilled to master relevant skills [5]. At the same time, students can practice in groups and conduct simulation exercises under the guidance of teachers. By playing the roles of patients and medical staff, interns can deepen their learning of arrhythmia ECG. (3) The importance of electrocardiogram learning was emphasized to the interns during the course of education. The electrocardiogram is often used to monitor vital signs in clinical work. The interns should master the knowledge of electrocardiograms and learn to identify arrhythmia on the electrocardiogram so as to provide timely treatment. If paroxysmal ventricular tachycardia or ventricular fibrillation occurs in critically ill patients, the failure of interns to detect it in time will affect the success rate of first aid and endanger the lives of patients. If interns can be aware of the importance of ECG learning, they can improve their learning enthusiasm, so as to obtain better learning results. (4) The arrhythmia electrocardiogram in the general department of our department is prepared into multimedia courseware according to the difficulty, and interns are organized to watch and study, teachers ask questions, students give answers and analyze the reasons, and teachers give comments. This question-based teaching method can improve the recognition ability of interns on electrocardiograms. (5) Intensive teaching was carried out for interns. For abnormal ECG characteristics of arrhythmia patients, the students' impression was deepened by repeated emphasis and emphasis, and the students' memory was deepened by summarizing after class and asking questions in the next class. The teacher made a multimedia video of ECG, summarized the symptoms and signs of arrhythmia, and sent it to the interns through the WeChat group and QQ group so that they could watch and read it by themselves after class, which also helped to strengthen their knowledge level of the interns. The regular review was conducted, and the interns were required to analyze the ECG based on clinical cases [6]. (6) Before the end of each class will be distributed to interns, electrocardiogram recording paper by its record in the chart to draw classroom lesson the teacher tells the arrhythmia types of ECG waveform, such as (1) Of ventricular premature beat, draw the early emergence of deformity, wide QRS wave, no relevant before P wave, T wave after the opposite direction and the main wave of QRS complex; (2) Ventricular fibrillation: the amplitude, interval and shape of the vibration wave were absolutely irregular [7-8].

2.3. Observation Indicators

Comparison between groups: (1) theoretical test scores and operational skills scores, with full marks of 100; (2) Students' satisfaction with teaching. Using homemade satisfaction survey department to understand the satisfaction of two kinds of teaching methods, can be divided into not very satisfied, very satisfied, more satisfied and statistics to select different satisfaction degrees of the number of cases, and by the "total satisfaction = (is very satisfied with the number of cases obtained satisfactory + cases) present * 100% total" formula to calculate [9].

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2.4. Data Analysis Methods

SPSS19.0 software was used for data processing. Data types were divided into count data and measurement data, with N (%) and (X), respectively-±s), chi-square value ($\chi 2$) and T value were used for test, respectively. If the P value was < 0.05 after statistical calculation, there was a significant difference between the groups.

3. The Results

3.1. Theoretical Test Scores and Operational Skills Scores

Inclusion criteria: (1) no systematic training experience such as electrocardiogram recognition before teaching; (2) The same learning ability; (3) the same courses taken; (4) the same teaching hours as the lecturers; (5) all students are full-time students; (6) All subjects gave informed consent to the study. Exclusion criteria: participants who were unable to participate in important aspects of the study due to various reasons.

The operational skills scores of the interns in the study group were higher than those of the control group, P < 0.05, and all statistical comparisons were different. See the Table 1.

Table 1: Between-Group comparison of Theoretical test scores, Operational Skills scores (X-+ s).

Grouping	Theory test scores (points)	Operational Skills score (points)
Study group (n=400)	90.77 + / - 9.02	88.46 + / - 7.34
Control group (n=400)	79.82 + / - 8.12	74.33 + / - 6.25
t	18.045	29.314
P	0.000	0.000

3.2. Interns' Satisfaction with Teaching

The total satisfaction rate of the students in the study group (96.75%) was higher than that in the control group (90.75%), P < 0.05, and the difference was statistically significant. See the Table 2.

Table 2: Intergroup Comparison of Interns' satisfaction with teaching (N, %)

grouping	Very satisfied with	The more satisfied	Not very happy	Total satisfaction
Study group (n=400)	301 (75.25)	86 (21.50)	13 (3.25)	387 (96.75)
Control group (n=400)	200 (50.00)	163 (40.75)	37 (9.25)	363 (90.75)
$\chi 2$	-	-	-	12.288
P	-	-	-	0.000

3.3. Analysis

The results showed that the total satisfaction rate of the students in the study group (96.75%) was higher than that in the control group (90.75%), and the scores of operation skills of the students in the study group were higher than those in the control group (P < 0.05). Diversified teaching methods can improve the students' learning effect on arrhythmia ECG more effectively. The main reasons are as follows:

(1) The traditional teaching method is based on the syllabus. Although interns can have a certain understanding of electrocardiograms in school, their impression of electrocardiograms has disappeared after a period. Some interns do not know much about electrocardiograms even in school, and it is more like listening to books in the chapter on arrhythmia. This makes it impossible to fully grasp the relevant knowledge of arrhythmia electrocardiogram, in the stage of the internship, the theoretical knowledge of electrocardiogram cannot be fully understood, and unable to correctly analyze electrocardiogram. However, diversified teaching methods can combine theory and practice reasonably, which can deepen the impression of interns and arouse their learning enthusiasm. Interns can more easily link the two together, which not only improves their theoretical level but also improves their practical ability.

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(2) The diversified teaching method repeatedly emphasizes the importance of learning electrocardiograms, which also arouses the learning enthusiasm of interns.

(3) The use of multimedia courseware can be used for teaching; interns can understand the relevant knowledge at a glance.

(4) Repeatedly emphasizing knowledge points, can deepen the impression of interns.

(5) The question-based teaching method can cultivate the independent thinking of interns and mobilize their learning enthusiasm. Asking students to record the ECG waveform before the end of class is also helpful to deepen the impression of interns and improve their recognition ability of different types of arrhythmias.

(6) Using the spare time to push the news can also improve the learning effect of interns [10-12].

4. Conclusion

Compared with the traditional teaching method, the diversified teaching method has a more significant application effect and higher feasibility in ECG teaching, which can effectively improve the theoretical level and operational ability of interns and make interns more satisfied with the teaching effect.

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