Review Article

Open Access

Diagnosis of Standard Electrocardiogram for Emergency Treatment

Xu Han-You

Clinical Institute, Department of General Internal Medicine, International Liasom Hospital in Anji, Huzhou, Zhejiang Province China

ABSTRACT

Objective: In order to diagnose standard electrocardiogram well and rapidly for emergency treatment, the research has been done.

Methods: The author researched and summarized the methods of rapidly diagnosing standard electrocardiogram in department of emergency medicine he worked. It was a retrospective analysis of the doctor practices of author on random patients for emergency treatment who needed standard electrocardiogram examinations.

Results: There are at least 7 methods to do the diagnosis well. One of them is, the operator of doctor should stare at the movements of the tracing "pen" of the machine of standard electrocardiograms and the graphs of standard electrocardiograms. So the standard electrocardiograms is scanned and diagnosed at once just when the graphs of standard electrocardiograms were produced.

The rightness percent rate of the new diagnosis method is 98.2%. The diagnosis time is much too faster.

Conclusion: The new method of rapidly diagnosing standard electrocardiogram for emergency treatment is worth to be applied widely and to be referenced by family physician and other clinicians to care patients well, apart from the doctors of emergency medicine. The author also suggests the reforms to the standard electrocardiogram machine.

*Corresponding author

Xu Han-You, Clinical Institute, Department of General Internal Medicine, International Liasom Hospital in Anji, Huzhou, Zhejiang Province China. Tel: 0086-15518962531; Email: abc13579-you@126.com

Received: October 09, 2021; **Accepted:** October 18, 2021; **Published:** October 28, 2021

Keywords: Emergency medicine, Electrocardiogram diagnosis, standard electrocardiogram, quality improvement, Technology of Electrocardiogram diagnosis, clinical practice

Introduction

It is well known that interpretation of standard electrocardiogram for diagnosis and treatment of heart diseases and other diseases is very important and imperative. Therefore, it is said that how better the interpretation of standard electrocardiogram in one hospital expresses how better the hospital is. So it is much too important and imperative to educate the family physician and other clinicians or other practitioners for speedy interpretation of standard electrocardiogram, apart from the doctors of emergency medicine.

By the social developing, the emergency medicine develops rapidly and display more and more important. The interpretation of standard electrocardiogram becomes more and more important in emergency medicine. The slogan of medical workers in emergency medicine is: "The time is life". Therefore, rapid interpretation of standard electrocardiogram for emergency treatment is the main safeguard of people's life and time.

The primary health care of family physician needs rapid interpretation of standard electrocardiogram for emergency

medicine. The other clinicians also need rapid interpretation of standard electrocardiogram for emergency medicine. To say nothing the cardiac electro-physiologists, who must be the specialists in rapid interpretation of standard electrocardiogram.

The author has been working in the department of emergency medicine more than ten years, and has operated the electrocardiogram machine for standard electrocardiograms lots of times. So his experiences prove the importance of rapid interpretation of standard electrocardiogram for emergency treatment. That is why the author researched on the methods of rapidly diagnosing the standard electrocardiogram. The new methods of rapid interpretation of standard electrocardiogram for emergency treatment, the author used, has contributed well to rapidly diagnosing and treating the emergency patients.

literature search/data sources

Up to now, there is not any related report published in this topic. Which is identified through a PubMed/MEDLINE search of the English-language literature on the key words of this paper. So the author reports his researches for references by family physician and other clinicians, apart from the doctors of emergency medicine. And the abstract of this paper has been published on international medical Journal [1].

Method

Research method

It is a retrospective analysis of the doctor practices of author on random patients for emergency treatment who needed standard electrocardiogram examinations.

The Model of electrocardiogram machine

The Model of electrocardiogram machine for this research is ECG-6511, produced by SHANGHAI KOHDEN Medical Electronic Instrument Corporation, China.

Method of Clinical research

Random patients for emergency treatment who needed standard electrocardiogram examinations were selected randomly by author himself when the author had been on duty in 6 years time, From June 20, 2000 to March 5, 2006. Every patient, when the author examined his electrocardiogram. The author at the same time rapidly read and diagnosed primarily the standard electrocardiogram of patient. And the time of rapid diagnosis was counted at emergency. After the standard electrocardiogram was examined and the emergency patients were treated properly. The author diagnosed the standard electrocardiogram routinely, carefully again like the interpretation of standard electrocardiogram for the patients who were not in emergency. The results of interpretation of standard electrocardiogram by rapid diagnosis of author and his routine careful diagnosis were compared. If the two results were the same or the main diagnosis by the rapid diagnosis were the same as the routine diagnosis. The author says the rapidly diagnosing standard electrocardiogram for emergency treatment is right. All the results of interpretation of standard electrocardiograms by rapid diagnosis of author and his routine careful diagnosis were compared. If the right rate of rapidly diagnosing standard electrocardiogram in all the randomly selected patients is $\geq 95\%$. The author considers the new methods of rapidly diagnosing standard electrocardiogram are significant and valuable. Because, from the viewpoints of basic statistics, that the difference between the two groups of diagnosing results is $\leq 5\%$ is significant and valuable.

Clinical medical recordings

From June 20, 2000 to March 5, 2006, there were lots of random patients for emergency treatment who needed standard electrocardiogram examinations and their standard electrocardiograms were examined. But among them, 55 clinical medical recordings of random patients were fully recorded. They were 29 males and 26 females in the 55 random patients. The oldest patient was 83 years old. The youngest patient was 15 years old.

The methods of rapidly diagnosing standard electrocardiogram
The methods of rapidly diagnosing standard electrocardiogram methods by author's clinical practices in this research were summarized.

The electrocardiogram machine operator for standard electrocardiogram must be a doctor. Who must have rich clinical medical experiences and medical knowledge. At the same time, at least the doctor shall master basic knowledge of electrocardiogram. The characters of the standard electrocardiograms of critical care patients or patients of common disease must be learnt and understood. It is better to know well the characters of the standard electrocardiograms of rare and special diseases.

The operator of doctor should give his whole attention to operate the electrocardiogram (ECG) machine. When operating,

the doctor should concentrate his mind on the moving ECG graphs. Who produced the diagnosis ideas of standard electrocardiograms immediately after scanning the moving graph of standard electrocardiograms. Then, when the graphs of standard electrocardiograms came out of the machine or were on the machine. The operator of doctor should prove and mend his former diagnosis ideas. So the rapidly diagnosing standard electrocardiogram was done.

The operator of doctor should stare at the movements of the tracing "pen" of the machine of standard electrocardiograms and the graphs of standard electrocardiograms. So the standard electrocardiograms was scanned and diagnosed at once just when the graphs of standard electrocardiograms were produced.

The doctor should master and be absolutely clear the graphs of standard electrocardiograms of common disease. So that the standard electrocardiograms can be diagnosed at once just the graphs of standard electrocardiograms were coming out. For example, the acute myocardial infarction, associated with ST-segment elevation $>0.1\text{mv}$; myocardial ischemia, associated with ST-segment depression $>0.05\text{mv}$; atrial fibrillation, showing tiny, irregular "fibrillation" waves between heartbeats and the rhythm is irregular and erratic; paroxysmal supraventricular tachycardia, the rhythm is regular and fast; premature ventricular beats, with large, abnormal, wide QRS spike and T wave inversion; et al.

When operating electrocardiogram machine and diagnosing rapidly the emergency standard electrocardiograms, the operator of doctor should combine patients' clinical syndromes with standard electrocardiograms and pay special attention to the diagnosis of standard electrocardiograms of the relative disease. For example, patient with chest pain more than 30 minutes, old ages and cold sweat, should be considered acute myocardial infarction as the most possible diagnosis. The operator of doctor or other practitioners should pay more attention to ST-segment elevation, the presence of Q waves and T waves changing, et al of standard electrocardiogram. So the rapid interpretation of standard electrocardiograms should be more easy to do. So as the other diseases and their characters of the standard electrocardiograms.....

The operator of doctor should scan swiftly the standard electrocardiograms when just finish the operation of standard electrocardiograms to further prove the rapidly diagnosed standard electrocardiogram for emergency treatment. At this moment, the emergency treatments for the special disease could be done when the operators of doctors were operating the machine of standard electrocardiogram. Which could speed up the emergency diagnosis and emergency treatment.

The routine careful diagnosis of standard electrocardiogram were done after the rapidly diagnosing standard electrocardiogram. For example, calculation and measurement of the graphs of standard electrocardiograms, looking up the table for diagnosis of standard electrocardiograms. et al. could be done carefully to prove if the rapid interpretation of standard electrocardiograms was right. Usually, the measurement, calculation and looking up the table for diagnosis of standard electrocardiogram were not needed for the rapidly diagnosing standard electrocardiogram in emergency diagnosis and treatment.

Results

The rapid diagnosis time of diagnosing standard electrocardiogram
The rapid diagnosis usually taken 5 ~ 8 minutes for the most

complexly changed abnormal standard electrocardiogram. The average rapid diagnosis time was 6.5 minutes for the most complexly changed abnormal standard electrocardiogram. And taken no more than 2 ~ 9 seconds for the easy diagnosed or complex abnormal standard electrocardiogram. The average rapid diagnosis time was 5.5 seconds for the easy diagnosed or complex abnormal standard electrocardiogram.

The routine careful diagnosis time of standard electrocardiogram were 20 ~ 30 minutes when the patients were not in emergency and (or) the patients were diagnosed by the electro-physiologists at the outward. The average time of diagnosis was 25 minutes by electro-physiologists of outward patients.

Numbers of patients who were rapidly diagnosed standard electrocardiogram rightly

Among the 55 randomly selected patients for emergency treatment who needed standard electrocardiogram examinations and were diagnosed and fully recorded by author himself using his methods of rapidly diagnosing standard electrocardiogram, only one patient was diagnosed wrongly according to above mentioned standard of judgment. So there were 54 patients whose standard electrocardiograms were rapidly diagnosed rightly.

The right rate of rapidly diagnosing standard electrocardiogram for emergency treatment

There were 55 randomly selected patients for emergency treatment who needed standard electrocardiogram examinations. 54 patients of standard electrocardiograms were diagnosed rightly. The right rate of rapidly diagnosing standard electrocardiogram was 98.2% (54/55).

Comparing the diagnosis time of rapid diagnosis and the time of routine diagnosis of standard electrocardiograms

The rapid diagnosis time was 3.85(25/6.5) times faster than the time of routine diagnosis of standard electrocardiogram in the most complexly changed abnormal standard electrocardiogram. The rapid diagnosis time was 272.73(25×60/5.5) times faster than the time of routine diagnosis of standard electrocardiogram for the easy diagnosed or complex abnormal standard electrocardiogram. So the author considered the methods of rapidly diagnosing standard electrocardiogram were significant and valuable.

Discussion and conclusions

The research by the author for rapidly diagnosing standard electrocardiogram was done according to the 55 randomly selected patients for rapidly diagnosing standard electrocardiogram. The right rate of diagnosis of standard electrocardiograms for emergency was 98.2% when he was on duty in emergency department from June 20, 2000 to March 5, 2006. And the rapid diagnosis time was much too faster than the time of routine diagnosis of standard electrocardiogram. The methods for rapidly diagnosing standard electrocardiogram written on upper paragraphs were summarized. The author considered the methods for the rapidly diagnosing standard electrocardiogram were practical, concise, simple, and worth to be applied widely in every hospital and clinic to treat the patients rapidly, accurately and efficiently. Which were good references for all family physicians and other clinicians, apart from the doctors of emergency medicine to diagnose standard electrocardiogram in emergency diagnosis and treatment. The technique was good for enhancing the primary health care of

family physicians and other clinicians. Which were valuable to be referenced.

The new methods were especially proper to treat the acute myocardial infarction patients for pre-hospital emergency treatments. For before pre-hospital emergency treatments of acute myocardial infarction, the rapidly diagnosing standard electrocardiogram must be done. Which the methods of rapidly diagnosing standard electrocardiogram were golden methods to diagnose acute myocardial infarction in pre-hospital emergency treatments to improve in door-to-electrocardiogram (ECG) times for adults presenting with symptoms suggestive of acute coronary syndrome.

The other patients for rapidly diagnosing standard electrocardiogram were also proper to use these new methods. In order to diagnose standard electrocardiogram clearly, the reforms are needed for present standard electrocardiogram machine. For example, changes may be made to let the doctors scan and read well and directly when rapidly diagnosing standard electrocardiogram for emergency treatment is applied. Also, the author proposes all family physicians and other clinicians, or doctors in emergency department and other medical departments should master the new methods for rapidly diagnosing standard electrocardiogram for emergency treatment.

Acknowledgment

Competing interests: None declared.

Funding: None

The Ethical Approval is applicable according to Chinese Medical Ethics Committees.

References

1. Xu Han-You (2008) Rapidly diagnosing standard electrocardiogram for emergency treatment. Heart, Lung and Circulation 17: 17-18.

Copyright: ©2021 Xu Han-You. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.