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Arrhythmia in Severe Fever with Thrombocytopenia Syndrome

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WIWANITKIT: *Arrhythmia in Severe Fever with Thrombocytopenia Syndrome:* There are many new emerging infectious diseases in the present day. In cardiology, the important concern is on the cardiac presentation of any new disease. Severe fever with thrombocytopenia syndrome is a new disease firstly reported from China and becomes the important emerging infection in East Asia at present. The disease is proved to be due to the new severe fever with thrombocytopenia syndrome virus, a newly identified pathogenic Bunyavirus, infection. This disease usually presents with high fever and thrombocytopenia. Focusing on cardiac presentation, it is evidenced that the cardiac arrhythmia can be observed in this new disease. Here, the author tries summarizing the observed arrhythmia in abnormal electrocardiograms from available 3 reports. Of 109 patients who got electrocardiography studies, 27 cases (24.8%) had arrhythmia. Focusing on the types of arrhythmia, there are sinus bradycardia (n=5), supraventricular arrhythmias (n=8), premature ventricular beats (n=5), atrial fibrillation (n=7), atrioventricular block (n=2), right bundle branch block (n=1) and ventricular fibrillation (n=1). Based on this summarization, the rate of arrhythmia in the patient with severe fever with thrombocytopenia syndrome is very high and there are several forms of possible arrhythmia in the patients. Sometimes, afebrile cases of severe fever with thrombocytopenia syndrome can be seen and the arrhythmia might be the chief complaint of the patient. In the present day with, good international transportation, the cardiologist has to keep in mind on the possibility of severe fever with thrombocytopenia syndrome in any patient with arrhythmia. (*J HK Coll Cardiol 2016;24:11-13*)

Arrhythmia, Fever, Presentation, Severe, Thrombocytopenia

摘要

近年出現了很多新興的傳染疾病，在心臟科，最重要的關注點是在任何新疾病中的心臟表現。「嚴重發熱伴血小板減少症候群」是首發於中國的新病症，現時並已開始成為東亞地區重要的新興傳染病。該病已被證實是由於一種新的嚴重發熱伴血小板減少綜合症病毒（一種最新被鑑定病原為本雅病毒科）的感染，此病通常會出現高燒及血小板減少症狀。聚焦於心臟的表現，可觀察這種新疾病會出現心律失常。在此，作者嘗試在現有的三個報告中，總結由不正常心電圖所觀察的心律失常。在109個進行心電圖研究的病人中，27個案例（24.8%）出現心律失常。仔細分析這些心電圖所觀察的心律失常的類別，包括竇性心動過緩（n=5）、室上性心律失常（n=8）、室性早搏（n=5）、心房顫動（n=7）、房室傳導阻滯（n=2）、右束支傳導阻滯（n=1）及心室顫動（n=1）。基於這些觀察所得的結論，在嚴重發熱伴血小板減少症候群的患者中有相當高比率出現心律失常，而且所出現的心律失常亦可能有多種類別。有時，「嚴重發熱伴血小板減少症候群」病人中可以出無發熱症狀，而心律失常甚至是病人主訴的病徵。現時國際交通發達，心臟科醫生必須時刻謹記心律失常有發生在任何患「嚴重發熱伴血小板減少症候群」的病人身上。

關鍵詞：心律失常、發熱、表現、嚴重、血小板減少

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Introduction

Infection is an important group of medical disorder. There are many new emerging infectious diseases in the present day. The good examples are emerging atypical influenza virus infections, new Ebola disease and Middle East Respiratory Syndrome (MERS). In cardiology, the important concern is on the cardiac presentation of any new disease. The occurrence of cardiac arrhythmia in new emerging infectious disease is very interesting. Recently, Wiwanitkit reported the concern on cardiac arrhythmia induced by new Ebola disease.¹ It is no doubt that the cardiac arrhythmia can be a forgotten clinical feature in the new disease.¹

Here, the author will specifically focuses interest on the new disease, "severe fever with thrombocytopenia syndrome". Severe fever with thrombocytopenia syndrome is a new disease firstly reported from China and becomes the important emerging infection in East Asia at present. The disease is proved to be due to the new severe fever with thrombocytopenia syndrome virus, a newly identified pathogenic Bunyavirus, infection.² This disease usually presents with high fever and thrombocytopenia.³ Focusing on cardiac presentation, it is evidenced that the cardiac arrhythmia can be observed in this new disease.

Materials and methods

This short study is a retrospective analysis on the clinical data on cardiac arrhythmia seen in cases with severe fever with thrombocytopenia syndrome. The author used the standard database (PubMed and SCOPUS) search for finding the publication on severe fever with thrombocytopenia syndrome. The reports with complete data on electrocardiogram were recruited for further detail analysis.

Results

Here, the author tries summarizing the observed arrhythmia in abnormal electrocardiograms from available 3 reports.^{1,4,5} Of 109 patients who got

electrocardiography studies, 27 cases (24.8%) had arrhythmia. Focusing on the types of arrhythmia, there are sinus bradycardia (n=5), supraventricular arrhythmias (n=8), premature ventricular beats (n=5), atrial fibrillation (n=7), atrioventricular block (n=2), right bundle branch block (n=1) and ventricular fibrillation (n=1).

Discussion

Severe fever with thrombocytopenia syndrome is a new problematic infectious disease. It is a main concern in China and East Asia at present.³ The disease is a new emerging viral tick-borne zoonosis.^{3,6} Also, the direct human to human contact has recently been reported as a mode of disease transmission.^{6,7} This new disease has a wide clinical spectrum. Li reported that the main clinical features of severe fever with thrombocytopenia syndrome include "high fever, thrombocytopenia, leukocytopenia, gastrointestinal disorders, and multi-organ dysfunction, with a high viral load and a high case-fatality rate".⁶ Nevertheless, in some cases, it might be asymptomatic⁸ and there is usually no hemorrhagic complication despite severe thrombocytopenia.⁹ In an unusual cases, atypical clinical presentation such as neurological presentation can be seen.¹⁰

Focusing on cardiac problem in severe fever with thrombocytopenia syndrome, Wiwanitkit reported that T wave disorder was common in the patients with this syndrome indicating possible direct cardiac involvement.¹¹ Here, the author summarize on the arrhythmia problem in cases with severe fever with thrombocytopenia syndrome. In the study, the author found cardiac arrhythmia in about ¼ of cases. Based on this summarization, the rate of arrhythmia in the patient with severe fever with thrombocytopenia syndrome is very high and there are several forms of possible arrhythmia in the patients. Sometimes, afebrile cases of severe fever with thrombocytopenia syndrome can be seen and the arrhythmia might be the chief complaint of the patient.⁴

Cardiac arrhythmias in the subjects might be secondary to many confounders, apart from the direct

effect of severe sepsis related to Bunyavirus infection. Confounding variables which could precipitate cardiac arrhythmias are electrolyte disturbance, cardiac enzymes, underlying pre-existing structural heart diseases, thyroid dysfunction, hemodynamic status (e.g. any septic or cardiogenic shock), ventricular function, LA sizes, etc. However, these data are usually not mentioned in the summarized reports. Nevertheless, focusing on the reported baseline epidemiological parameters of patients (age range 17-77 years old, average 55.2 years),^{1,4,5} most of the patients are more than 50 years old and have the risk of possible underlying cardiovascular problem. Hence, the problem is likely to be the secondary effect of hemodynamic instability and septicemia. Focusing on the possibility of direct effect of Bunyavirus infection (e.g. viral myocarditis, direct viral infiltration of conduction system), there has never been report on viral induced cardiac histopathology in cases of severe fever with thrombocytopenia syndrome. Nevertheless, the problem due to other Bunyavirus in animal model is observed.¹² The cardiac pathology in severe fever with thrombocytopenia syndrome has to be further systematically studied. Another myth on this topic that can be further research topic is the response of cardiac arrhythmia to pharmacological therapy. Indeed, ribavirin treatment is mainly used for management of the case, however, there is no report on observation on the cardiac arrhythmia.

Conclusion

In the present day with, good international transportation, the cardiologist has to keep in mind on the possibility of severe fever with thrombocytopenia syndrome in any patient with arrhythmia.

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