

## Case Study

# Serum Troponin-I as a Cardiac Marker for Rheumatic Heart Disease among Sudanese Patients with Tonsillitis in Khartoum State

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## Abstract

**Background:** Complications of tonsillitis are rare, and usually only occur due to untreated bacterial infection, One of these complications is a Rheumatic heart disease. **Objectives:** The aim of this study was to assess the level of troponin-I as a cardiac marker for rheumatic heart diseases among Sudanese Patients with recurrent Tonsillitis. **Methods:** a Cross sectional case-control study was conducted during the period from November to December 2017, forty samples from diagnosed patients with recurrent tonsillitis (admitted to Ear-Nose and Throat hospital in Khartoum state) as cases and forty samples from healthy individuals as controls, the level of troponin-I was measured by using an automated enzyme immunoassay system (TOSOH), Data analysis was carried out by SPSS version 16. **Results:** There was a significant increase of serum troponin-I level in tonsillitis patients with p-value = 0.036 when compared to healthy individuals (The (Mean±SD) was (0.126 ± 0.059) and (0.070 ± 0.004 U/L) in tonsillitis patients and healthy individuals respectively), Also there was a positive correlation between level of troponin-I and duration time of disease with (R= 0.437, p-value= 0.005), but there was no correlation between level of troponin-I and age with (R= 0.288, p-value= 0.071). **Conclusion:** the level of troponin-I is increased in tonsillitis patients and the increasing level is positively correlated with duration of disease.

**Keywords:** Tonsillitis, Rheumatic heart diseases, Troponin-I and Sudanese.

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## INTRODUCTION

Pyogenic (that is bacterial) tonsillitis may often be observed and it is known to account for a large number of pre-clinical consultations. In severe cases, it may require antibiotic treatment or even hospitalization and a prompt clinical response will often be noted, Bird *et al.*, 2014; Pratt and Kaplan, 1999. Complications of tonsillitis are rare, and usually only occur due to untreated bacterial

infection. One of these complications is Rheumatic heart disease which is a chronic heart condition caused by Rheumatic fever, WHO, 2004. Rheumatic fever is an acute inflammatory disease, principally of children, but also of adult, that usually follows pharyngeal or throat infection, with group A beta hemolytic streptococci. Rheumatic fever may affect many connective tissues of the body, especially the heart, Marijon *et al.*, 2012. The most serious result of rheumatic fever is called pancarditis (involving inflammatory of the myocardium, endocardium and pericardium) Dajani, 1999, (it is an

inflammation that affects all aspects of the heart) and valvulitis, Brice and Commerford, 2005, (The most valves affected by Rheumatic fever, in order are the mitral, aortic, tricuspid and pulmonary valves), Bonow *et al.*, 2006. Destruction of these valves and heart parts can release troponin protein.

A troponin test measure the levels of troponin T or troponin-I proteins in the blood. These proteins are released when the heart muscles have been damaged, Tehrani and Seto, 2013, therefore the aim of this study was done to assess the level of serum troponin-1 a cardiac marker of rheumatic heart diseases among Sudanese patients with tonsillitis.

## **MATERIALS AND METHODS**

### **Study design**

This was a Cross sectional case control study.

### **Study Area and Period**

Ear, nose and throat hospital Khartoum state during the period from November to December 2017.

### **Study Population**

Forty Patients with recurrent tonsillitis (chronic and acute tonsillitis) as a case and forty normal individual as control, gender and age was matched (case and control aged from 3 to 12 years, 26 (65%), 14(35%) were males and females).

### **Inclusion Criteria**

Patients with recurrent tonsillitis were included.

### **Exclusion Criteria**

Patients with rheumatic fever, heart disease, rheumatic heart disease, chronic disease such as Diabetic mellitus, hypertension and skeletal muscle leakage were excluded.

### **Ethical Consideration**

The study was approved by the ethical committee of Medical Laboratory Science, Clinical Chemistry Department, Alneelain University. Subjects involved in this study were informed of the aims of the study and its importance, and verbal informed consent was obtained from each participant.

### **Data Collection**

By using a questionnaire.

## **Sampling**

Blood samples were collected and serum was separated.

## **Method**

The level of serum troponin-I was measured by using automated enzyme immunoassay system (TOSOH).

## **Quality Control**

Pathological and Normal control sera were measured, to assure accuracy and precision of results.

## **Data Analysis**

Statistical package for the social science, computer program (SPSS) was used.

## **RESULTS**

There is a significant increase in the level of troponin-I among tonsillitis patients when compared to healthy individuals (figure 1). A positive correlation was found between level of troponin-I and duration of disease (figure 2). No correlation was found between the level of troponin-I and ages (figure 3).

## **DISCUSSION**

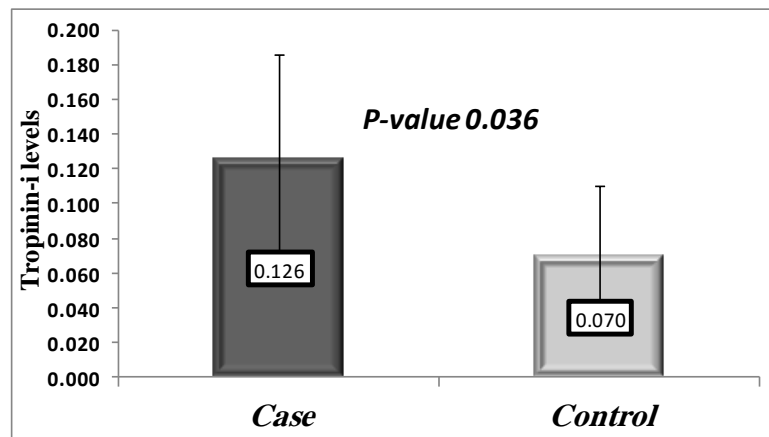
In the current study, the level of troponin-I, showed a significant increase in tonsillitis patients when compared to healthy individuals with p-value (0.036), that might be due to complication of tonsillitis which caused Rheumatic heart disease.

This finding was in agreement with results of previous studies done by (Sahin *et al.*, 2016), which reported that, Patients with elevated anti-streptolysin O (ASO) titers (ASOT) and recurrent tonsillitis episodes are known to be at higher risk for rheumatic heart disease (RHD) which increase troponin level.

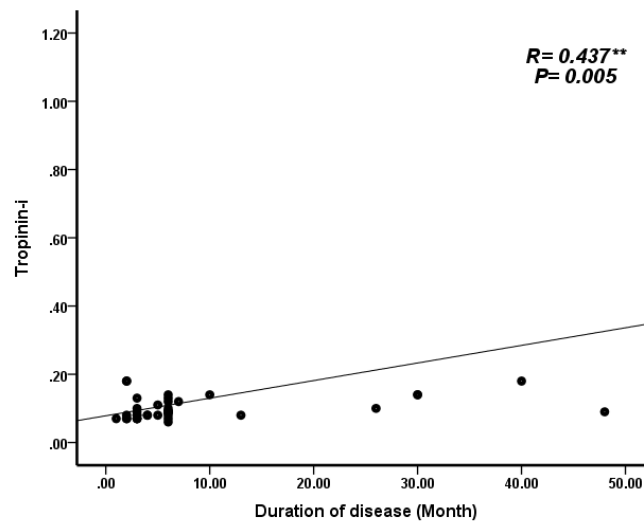
Also, there was a positive correlation between level of troponin-I and duration time of disease with ( $R= 0.437$ ,  $p\text{-value}= 0.005$ ), but there was no correlation between level of troponin-I and age with ( $R= 0.288$ ,  $p\text{-value}= 0.071$ ).

## **CONCLUSIONS**

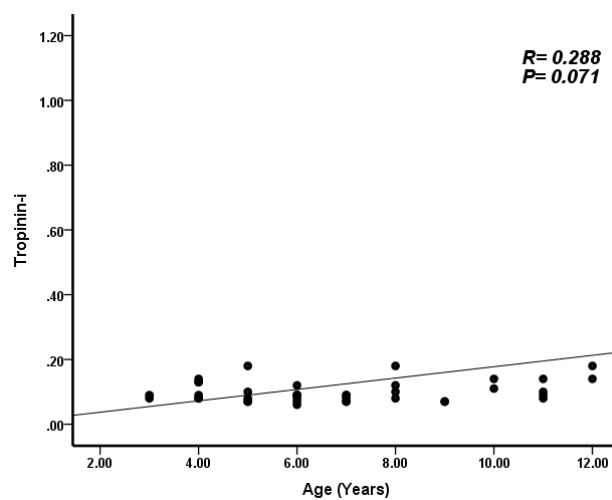
The level of troponin-I is increased in tonsillitis patients; this increase is positively correlated with duration of tonsillitis.



**Figure 1.** Comparison The level of troponin-I in case versus control  
P-value less than 0.05 consider as significant



**Figure 2.** Correlation between the level of troponin-I and duration time of disease.  
P-value less than 0.05 consider as significant



**Figure 3.** Correlation between troponin-I level and ages.  
P-value less than 0.05 consider as significant:

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