

# **Cryoglobulin Responses And Herd Immunity plots Among periodontitis Patients**

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## **Abstract**

A Cryoprotein was separated from periodontitis patients sera and characterized as a cryoglobulin. The cryocrit percentages were ranged from 1-8% in patients as compared to 1-3% in controls. The cryoglobulin concentration were ranged from 90-240 mg/L with mean value of 188 mg/L as compared to 1.3-4 mg/L. Immunofixation studies have shown secondary mixed cryoglobulinemia of IgA-IgG-IgM type. The assessment of herd immunity using cryoglobulin as a probe revealed that there are three main fraction as: low , moderate

and high responders. The herd immunity plots were normal and skewed respectively.

KeyWord: :  
Cryoglobulin, Cryocrit, Herd Immunity, Immunofixation

## **Background**

As a part of an ongoing program for the assessment of secondary mixed cryoglobulinemia [2018 ICD- 10 –CM diagnosis code D 89-1] in chronic infection diseases of human beings which covers tuberculosis <sup>[1]</sup> , typhoid <sup>[2]</sup> , Brucella <sup>[3]</sup> , and tonsillitis <sup>[4]</sup> . The present work was devoted to assess the cryoglobulin responses among chronic periodontitis patients and their possible use as marker for the herd immunity as well as utility in herd immunity plots.

## **Material And Methods**

Twenty two dental diseased patients attending the college of dentistry during the period

, were diagnosed by the specialist dentist as chronic periodontitis <sup>[5]</sup> . These patient constitute the study group. Blood samples were drawn from patient and sera were saved <sup>[6]</sup> cryocrit study was made as in <sup>[7]</sup> . single radial immunodiffusion partigens of IgA , IgG , IgM (Behring Co.)

in accordance with manufacturer instruction. Protein determinations were made by Beirut method <sup>[8]</sup> . Rheumatoid factor testing done as <sup>[6]</sup> biometric analysis of the results were done as in <sup>[9]</sup>

## **Findings**

### **1- Cryoglobulin:**

The separated Cryoprotins found as ; Colloid , opaque , Crystallino or gelatinous in textures , Biuret test positive , precipitated at 4C° within 1-5 days , dissolved at 37C. and reprecipitated 4 C°.

### **2- Cryocrit:**

The cryocrit percentages were ranged from 1-8% in periodontitis patients as compared to 1-3% in normal subjects. Table1.

### **3- Cryoglobulin concentration :**

The cryoglobulin concentration were ranged from 90-240 mg/L with the mean value of 188.1 mg/L as compared to 1.3-4 mg/L in control , Table2.

### **4- Immunofixation :**

The single radial immunodiffusion studies for the cryoglobulin isotypes have shown that the periodontitis cryoglobulin responses were of secondary mixed types as IgG- IgM-IgA , Tables 3,4. Rheumatoid factor positive cases were of higher cryoglobulin isotype concentration than that of negative cases table 3-4.

### **5- Cryoglobulin response And Herd plots**

When total cryoglobulin concentration were used as marker for herd immunity three fractions were evident as low , moderate and high responds the herd plots was of skewed type.

**Table 1: The biometry of cryocrit % in chronic Radiation patients**

<b>Statistical feature</b>	<b>Cryocrit % value</b>
Minimum	1
Median	2
Mean	5.86
Maximum	8.0
Range	1-8

**Table 2: The Biometry of cryoglobulin Concentration for the chronic periodontitis patients**

<b>Statistical features</b>	<b>Cryoglobulin Concentration mg/L</b>
Minimum	90
Median	170
Mean	188.1
Maximum	240

Range	90-240
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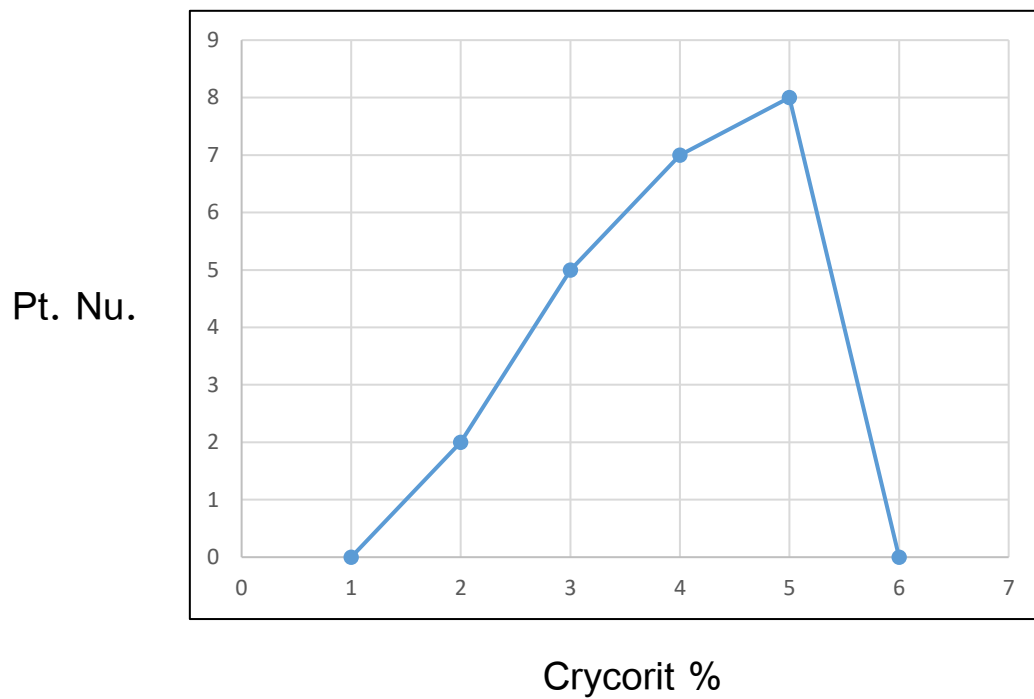
**Table 3: Immunofixation Assessment of chronic periodontitis patients**

<b>Cryoglobulin isotype</b>	<b>RF+ mg/L</b>	<b>RF- mg/L</b>	<b>Total Cryoglobulin mg/L</b>
IgM	19.8*	18.80*	11.1*
IgG	218.72	175.097	200.71
IgA	62.17	59.6	54.06

**\* mean value**

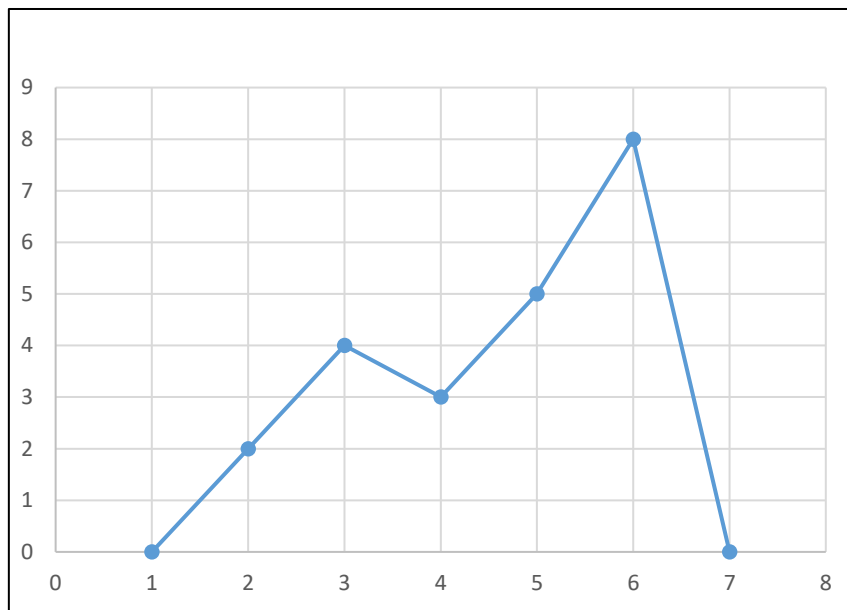
**Table 4: The biometry of Cryoglobulin isotypes in chronic periodontitis patients**

<b>Features</b>	<b>IgM mg/L</b>	<b>IgG mg/L</b>	<b>IgA mg/L</b>
minimum	1.40	112.08	29.5
median	17.40	188.21	54.74
mean	11.11	200.76	54.06
maximum	28.66	258.26	83.73
Range	11.9-28.66	112.08- 2582.6	29.5-83.73



**Fig 1:**  
**(Periodontitis herd plot using Cryocrit % as a probe)**

Pt. Nu.

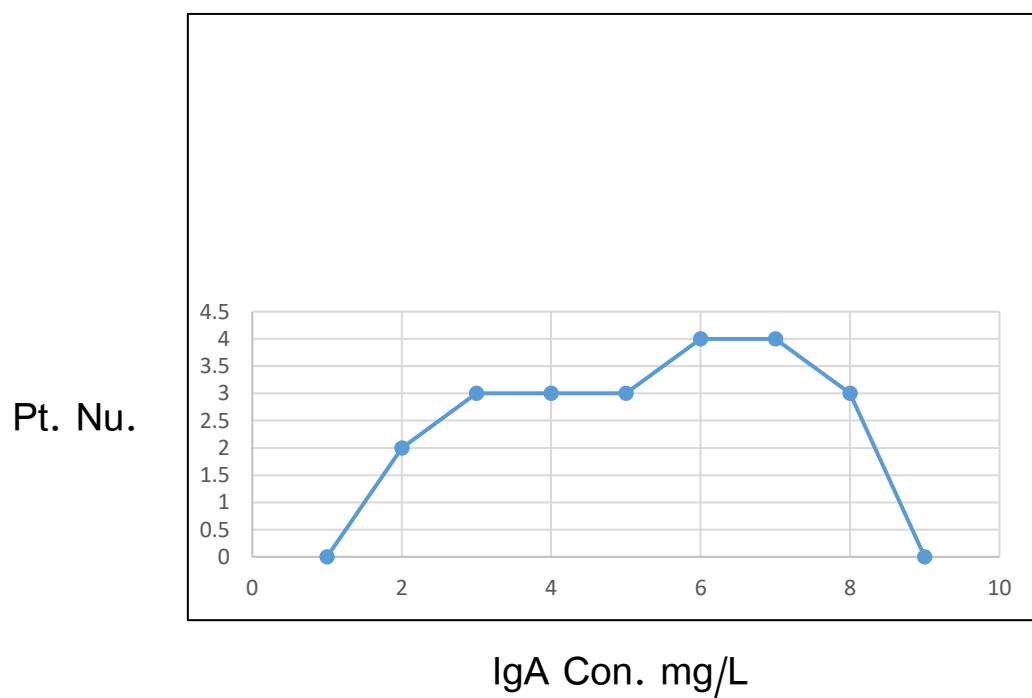


Conc. mg/L

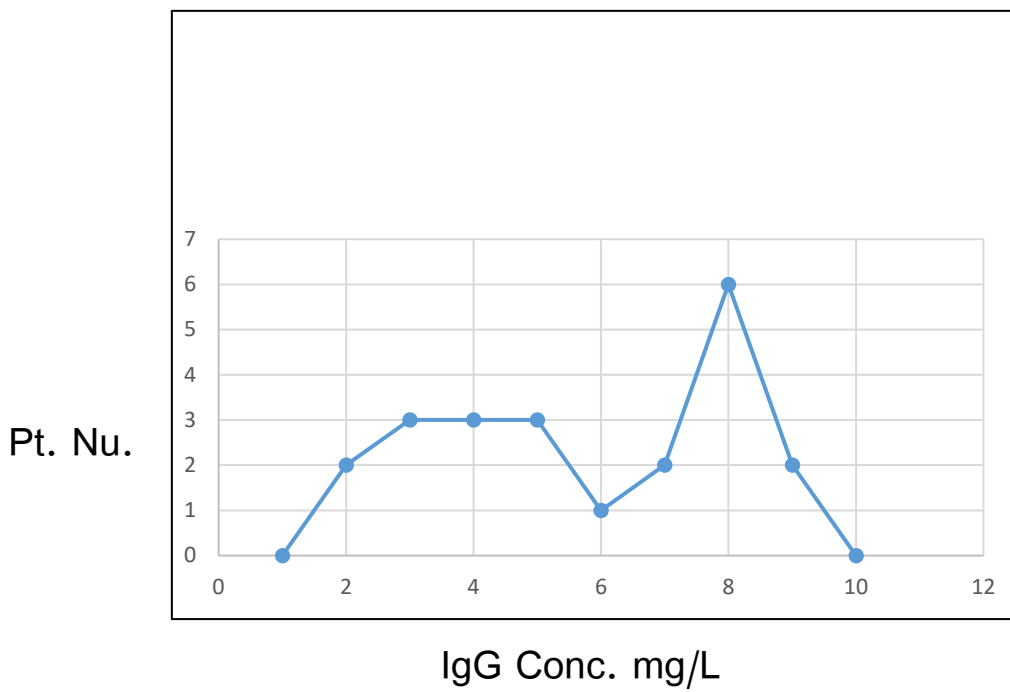
**Fig 2:**

**( Herd plot using Cryoglobulin as a probe )**



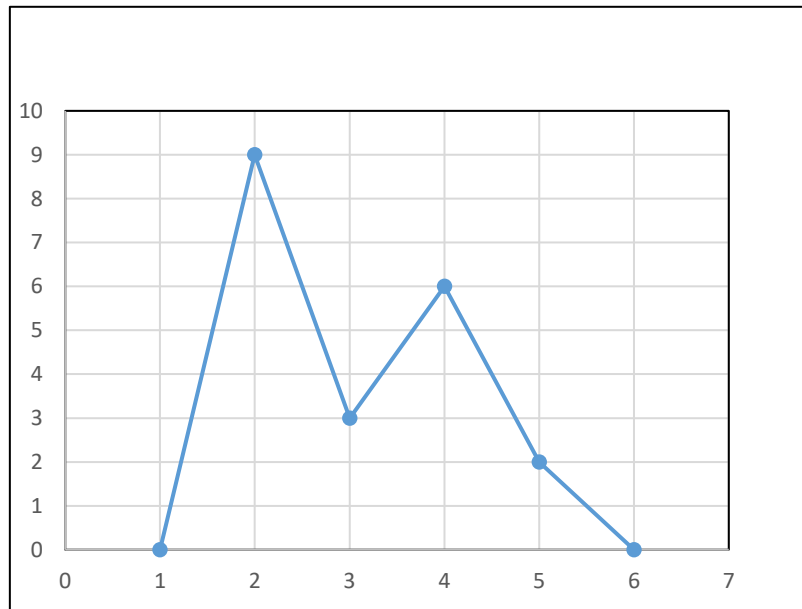


**Fig 3:**  
**( Periodontitis herd plot using IgA as a probe)**



**Fig 4:**  
**( Periodontitis herd plot using IgG as a probe )**

Pt. Nu.



IgM Conc. mg/L

**Fig 5: ( Periodontitis herd plot using IgM as a probe )**

When isotype used as single entity markers for herd immunity plots. It was , also evident that the plots were of skewed type. Thought when cryocrit percentages used as probe for herd immunity the herd plot type was of normal distribution type , Fig. 1-5.

### **Discussion**

The separated cryoproteins from the patients sera were characterized as cryoglobulins <sup>[7]</sup> and the immunofixation studies were shown that these cryoglobulin responses . were of secondary mixed cryoglobulinemia. The cryoglobulin responses profile was of IgM-IgG-IgA type Table 1-4 <sup>[10]</sup>. These findings were supported by similar results for the cryoglobulin association with tonsillitis patients <sup>[4]</sup>. Rheumatoid factors positive case showing higher cryoglobulin isotype concentration than that Rheumatoid factor negative cases <sup>[10]</sup>. The herd immunity were found to be as low , moderate and high responders.

Cryocrit herd plot was of normal distribution curve. Total cryoglobulin , IgM, IgG, and IgA herd plots were of skewed types <sup>[11,12,13]</sup>. Thus , secondary mixed. IgM-IgG-IgA cryoglobulin response were found in association of chronic periodontitis .

### Conclusion

Secondary mixed cryoglobulinemia was found associated with periodontitis patients.

### Conflict of interest

We have no conflict of interest with any academician in any institute .

### Source of Funding

It is self

### **Ethical Clearance :**

The project was formally registered. The clinical sampling was performed by the dentist of research tem using noninvasive standard techniques with satisfaction of the study patients and controls.

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