WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 5.045
Volume 3, Issue 7, 45-49. Research Article ISSN 2277 – 7105

PYROGLOBULIN AND HUMAN ARTHROPATHY

***Ibrahim M S Shnawa**

Department of Biology, College of Science, University of Babylon.
College of Biotechnology, University of Babylon-Kasim Green University, Kasim, Babylon/IRAQ.

Article Received on
20 July 2014,

Revised on 12 August 2014,
Accepted on 06 Sept. 2014

***Correspondence for Author**
Dr.Ibrahim M S Shnawa
Department of Biology, University of Babylon-Kasim Green University, Kasim, Babylon/IRAQ.

ABSTRACT

Two cases of pyroglobulins were found among 138(1.45%) arthropathy human patients sera but not from the 25 apparently normal control subjects sera. The first of which was showing; Semi-opaque and viscous precipitate. While the second reveals jelly-like precipitate. These pyroglobulins were coexisted with copyroprecipitates in a rat of 20:138(14.49%).Whereas, these two cases have shown clinical significant concentration of the inflammatory immunoproteins ,CRP 48.5, 57.5 mg /IU/ml and the normoglobulin responses, Rheumatoid factor 57, 68 mg/ml. The author is of the opinion holds that there may be a presence of pyroacting B lymphocyte clones within their immune system components that are involved in this pyroglobulin response initiation and mounting, since it has been reported with different isotypes and different clinical settings, though their rarity.

Keywords: Arthropathy, copyroprecipitate, pyroglobulin, pyroprecipitate, rheumatoid factor.

The human mucosal and circulatory B lymphocyte systems are most often polyclonal activated *in vivo* through either direct or via the action of interdigitating dendritic cells or Th2 cells instructing antigenic stimuli with an outcomes of gamma immunoglobulins. These immunoglobulins upon subjection to heat, they behaved; normo, cryo or pyroglobulin entities. Such entities were assessed under temperature range from 4C to 60C[1,2]. Both of the cryo and pyroglobulins were associated with neoplastic, lymphoprolipherative and/or chronic microbial infections[3]. Normoglobulin responses have been reported in arthropathy patients[4,5]. Cryoglobulin responses have been documented by the author and colleagues in tuberculosis, typhoid and brucellosis[6,7,8]. Pyroglobulin, however is defined as an atypical

gamma immunoglobulins characterized by its irreversible heat denaturation at 56C for 30min.Pyroprecipitation is inhibited in an extreme PH l of 3 and more than 9.The pyroglobulin precipitate binds complement ,react with rheumatoid factor ,produce passive cutaneous anaphylaxis and passive arthus type phenomena[9].The objective of the present work was to report on the observation two pyrglobulin bearing arhropathy patients sera.

During the period of 2013-2014 in Babylon provience, both at rural and civilian areas.A total of 138(Table 1), arthropathy patients[10,11],checked by the general practitioners in rural and by rheumatologist in civilian capital hospitals. The patients were showing, arthralgia, backachae, fever, difficult mobility with duration of few days to several weeks with an age range of 22-70 years and from both sexs. A twenty-five apparently normal subjects were elected as controls with an age range matching those of patients group. Five ml blood samples were collected from each of the test patient and controls. Erythrocyte sedimentation rate ESR ,acute phase protein C CRP and rheumatoid factor RF were done both for patients and controls[13]. Part of which were processed for ESR while the other parts were tubbed in sterile disposable plain tubes then sera were saved. Their ESR ranged from35-145 mm[10], positive CRP test in a rate of 42:138(30.43%) . While, rheumatoid factor was positive in a rate of 12:138(14.4%) The 138 and the 25 patients and control sera were subjected to waterbath incubation at 56C for 30 mins. Manual gross visual detection for the appearance; viscosity ,jellification and pyroprecipitatition were reported[14,15]-Copyroprecipitate: For the exlusion of copyroprecipitate from pyroprecipitate, samples were reincubated at 37C for 30min.If they are solubilized, it will be copyroprecipitate, if not it pyroglobulin[14,15]. Upon heat treatment of the 138 test and the 25 control sera at56C for 30mins.Control sera were with no change, while the test sera were showing; six physical texture entities existed as; No change, viscosity, opalescence, mesh-like firm granular precipitate, frank precipitate and jelly-like appearance.

There were two out of the 138(1.45%) serum samples were showing irreversible pyroprecipitates at 56C for 30mins. The first was semi-opaque and *viscous*. It starts as no change, viscous, opalescence then precipitate. While the second was starting as no change, viscous, opalescence then jelly-like Figure 1 and 2. Reversable precipitates were noted in a rate of 20:138(14.49%) a copyroprecipitates Table. Both of the two pyroglobulinemic sera were showing clinical concentration levels for the acute phase protein C and rheumatoid factors .Since, the CRP concentrations were 48,5 and 57.5 mg/ml.for case 1 and 2

respectively. While, RF concentrations for case one was 57 mg/ml. and for the case two was 68 mg/ml.

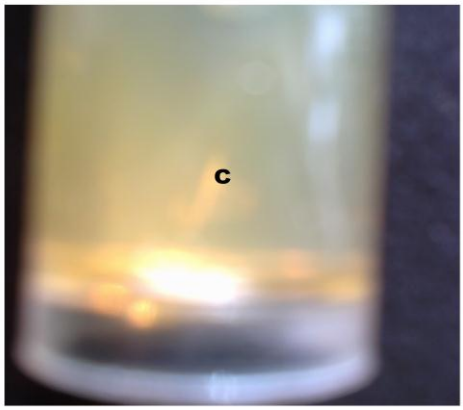

Figure 1 : Case Number 1
Semi-Opaque Viscous Pyroglobulin Precipitate

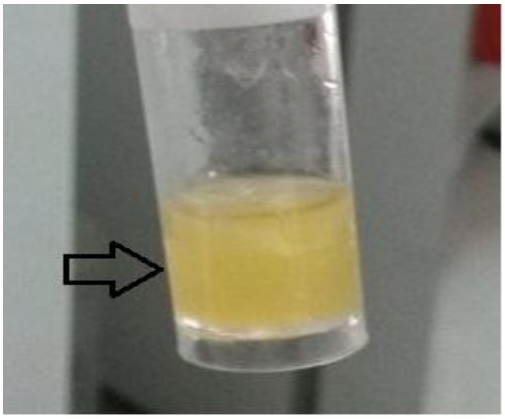

Figure 2 : Case Number 2
Jelly like Pyroglobulin

Table.1 : Pyroprecipitate In arthropathy Patients

Series	Positive:total(%)	56C	37C	Entity
1	0:8(0%)	0	0	0
2	10:49(7.85%)	+	S	C
3	3:22(13.68%)	+	S	C
	1:22(4.545%)	+	IS	Py
4	7:49(14.28%)	+	S	C
	1:49(2.04%)	+	IS	Py

0=Negative
+=Positive precipitate
C =Copyroprecipitate
IS =Insoluble
S=Soluble
Py =Pryroglobulin

Two cases of pyroglobulin are being reported in association arthropathy Tables 1 and figure 1 & 2 of the pyroglobulins can be explained on the basis of hyrophorbic bond formation and/or defficient polarity of the immunoglobulin chains as well as due to unique intermolecular in bonding [14,15].Whereas the author is of the opinion holds, a presence of a pyroacting B cell clones within the components of the patient immune system cell clones that can be stimulated by the antigen(s) to produce polyclonal pyroglobulin of IgM[16], IgG[17], IgA[18]and IgD[19] isotypes even though their rarity. Pyroglobulin responses have been reported in plasma cell leukemia[18], betathalasemia[19], normal aged male[20], osteoclastic myeloma[21] and in association of rheumatoid factor[22]. Thus, it is being reported for the first time in arthropathy patients in this study in a rate of 1.44% as compared to others in other clinical settings as 3.076%[23].

ACKNOWLEDGMENTS

The author wish to express his gratitude to the general practitioners in rural and to the rheumatologists in the capital hospitals of the Babylon province for referring the cases. Thanks due to the technical help extended by Mr. Khalied Al Zamily, Ph.D. student in the department and by the honor forth year undergraduate student Ali Dahir.

REFERENCES

1. Paul W .Fundamental of Immunology 6th ed. Walter Kluwer lippincotte, Williams and Wilkins, 2008, USA.
2. Parslow TG, Stites DP, Terr AI, Imboden JB. Medical Immunology 10th ed. Lange Medical books, 2001 NY.
3. Dispenzieri A and Gorevic P.Cryoglobulinemias. Haematol. Oncol. North. Amr. 1999; 13(6): 1315-1349.
4. ShnawaIMS and ALamidi BHH. Senescence and immunity in some arthropathy patients Med.JBabylon, 2007; 4(3&4): 343-349.
5. ShnawaIMS and ALamidi BHH. Streptococcus pyogenes and Staphylococcus aureus specific mucosal and systemic immune responses of patients with arithritisKufa Med.J., 2008 ; 11(1) :304-306.
6. ShnawaIMS and ALGherani EFH. Effect of aging on cryoglobulin responses in pulmonary tuberculus patients. Babyl. Uni.J., 2014 ; 22(2):738-748.
7. ShnawaIMS and ALSerhanAJ. Mixed IgM, IgG and IgA cryoglobulin response in human typhoid patients. ISOR Journal of Pharmacy and Biology, 2014; 9(2): 26-29.
8. ShnawaIMS and Jasim YA. Mixed two variant types of cryoglobulinemia associated with brucellosis human patients World Journal of Pharmaceutical Research, 2014; 3(4):1883-1889.
9. Matsuda J. Pyroglobulinemia. Nippon Rinsho, 2005; 63(7);17-20.
10. ShnawaIMS and ALDulimi, KAH .Acute phase protein, antistreptolysineO, Rheumatoid factor and the humoral immune classification of Arthropathy. Baby. Uni.J., 2002; 7(3):1278-1286.
11. Isenberg DA, Tucker LB. Contraversies in Rheumatology. Martin Dunitz Cio.1997 UK.
12. Lewis SM, Bain BJ, Bates I.Dacie and Lewis Practical Haematology 9th.ed.Churchill - Livingstone, 2001, London.
13. Stevens CD. Clinical Immunology and Serology: ALaboratory Perispective 3d.ed. FADavis. 2010, Philadelphia.

14. Patterson R, Roberts M and Pruzansky JJ.Studies on heat Precipitable immunoglobulin.Clin.Exp.Immunol.1970;7:657-670.
15. Patterson R, Nelson VL and Pruzansky JJ. Pyrogloulinemia, some characterstics of heat labile proteins. Immunol.1965; 9:477-482.
16. StitesDP, StoboJD, Basic and Clinical Immunology 6th.ed, Appleton and Lange,1987,duliban.
17. TichyM, Hrncir Z, Hrkal Z.The properties of IgM-L pyroglobulin. Clinica. Chimica Acta, 1972; 36(2):363-368.
18. Nasu H, Warabi H. Immunochemical properties of IgG pyroglobulin in patients with plasma cell leukemia. Rihsho. Ketsuck.1979; 20(5):485-489.
19. Sugai S.IgA pyroglobulin, hyperviscosity syndrome and coagulation abnormalities in patients with multiple myeloma, Blood 1972; 39:224-237.
20. Ohno T, Furukwa H,Kanoh T, Uchino H. The physicochemical properties and pyrojel formation of IgD pyroglobulin.Clinica.Chimica.Acta.1986; 160:235-243.
21. Ruiz-Arguelles A,Valls-de-Rurz M,Domiguez C,Barraneo A,Ruiz-ArguellesC,Ruiz-Reyes, Incomplete pyroglobulin gamma disease in patients with osteoclastic myeloma. Scand.J. Haemtology 1984; 33(4):351-355.
22. Hrncir Z,Tichy M ,Demonstration of pyroglobulin in the investigation of rheumatoid factor .Arthritis and Rheumatology,1979; 22(1):100-101.
23. Invernizzi F, Cattaneo-di-SanSecondo V, Balestrier G, Zanussi C. Pyroglobulinemia. Acta. Haematologica.1973; 50(2):65-74.