

The Relation Ship between Psoriasis and Some Bio Chemical Studies (Alkaline Phosphates, Immunoglobulin and trace elements)

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الخلاصة :

أجريت هذه الدراسة على 81 شخص (أنثى، ذكور) توزعوا بين (55 مصاب بداء الصدفية)، (26 متبرع من الأصحاء) حيث تم استحصال العينات من مستشفى الحسيني العام / محافظة كربلاء و مستشفى الهندية العام / قضاء الهندية. إضافة إلى بعض العينات التي تم الحصول عليها من بعض عيادات اختصاصي الجلدية شاكرين تعاونهم معنا وعلى مدى ثلاثة أشهر ولم يؤخذ بعين الاعتبار العمر والجنس للمتبرعين لأن المرض يصيب الإناث والذكور على حد سواء لاعتماده على مناعة الجلد دون تمييز كذلك ليس للمرض عمر معين حيث يصيب جميع الأعمار على حد سواء (حسب استشارة أطباء الأمراض الجلدية حصراً).

وقد تناولت الدراسة اجراء بعض الفحوصات الكيميائية الحيوية على مرضى داء الصدفية ولقد اشتمل البحث على دراسات عديدة مثل قياس انزيم (AIP) الالكلاين فوسفاتيز ومقارنة النتائج للمرضى والأصحاء وكذلك قياس المنعقات Immunoglobulines (IgG, IgA, IgM) وبعض العناصر الضئيلة (Zn, Cu) لدى المصابين بداء الصدفية والأصحاء على حد سواء. وفي نهاية الدراسة كشف البحث عن وجود انخفاض في مستوى المنع نوع IgG لدى المصابين بداء الصدفية عن مستواه الطبيعي لدى الأصحاء وكما يصاحب هذا الانخفاض ارتفاع بمستويات كل من عنصر الزنك وانزيم الـ AIP وانخفاض مستوى عنصر النحاس. وقد تم تفسير النتائج على اساس التحفيز المناعي للجلد وعلاقته بالمرض.

Abstract

This study was done on (81) person male and female divided into 55 patients with Psoriasis and 26 healthy person. The samples are taken from Al – Hussain hospital, Al – Hindia hospital and some private clinic of dermatological specialist in duration of 3 months.

Age and sex had no value here, because of disease attack all ages and male female ratio are equal and the disease depend on Immunity of skin not to age or sex our study research some biochemical studies like levels of AIP, IgG, IgA, IgM and serum level of Zn and Cu, In healthy and Psoriatic patients. The results of this study founded ↓ level in IgG, Cu and ↑ level in sera of AIP and Zn, all results explained to relation this between the disease and immunological excitation of skin.

Introduction

Psoriasis is a chronic non – infectious inflammatory skin disorder, characterized by well – defined erythematous plaques bearing large adherent silvery scales⁽¹⁾. It can start at any age but is rare under 10 years⁽²⁾. The precise cause of Psoriasis is still unknown. However, there is often genetic predisposition, and some times an obvious environmental trigger^(2,3). The genetic abnormality is first to keratinocyte hyper proliferation that, in turn produces a defective skin barrier allowing the penetration by un masking of hidden antigens to which an immune response is mounted⁽³⁾. In a previous study it was demonstrated that pathological skin synthesized immunoglobulins (Ig) in different patterns, whereas in normal skin no synthesis was found⁽⁴⁾ serum Ig levels in patients with psoriasis have been determined quantitatively with the single radial immunodiffusion technique⁽⁵⁾. Many studies report an association between hepatitis C and psoriasis⁽⁶⁾. In a large study of psoriasis in monozygotic twins, heritability was high and environmental influence low.⁽³⁾ patients with psoriasis often have relatives with the disease and the incidence typically increases in successive generations. Multifactorial inheritance is likely⁽⁷⁾. Many studies raised the question of whether the local synthesis of immunoglobulins demonstrated in the lesional skin of patients with various skin disease is accompanied by an altered concentration of serum Ig⁽⁸⁾. Importance of trace metals like (Cu) and (Zn) in psoriasis was accepted by more studies^(5,6,7). Both elements are known to influence each other metabolism competition for binding sites

in the protein molecule of enzyme⁽⁹⁾. A positive result appears between high (Zn) but low (Cu) level with high (AIP) in psoriasis compared to the controls.

Materials and Methods

All chemical and standard solutions that used in this work was of highest analytical grade obtained from commercial sources and used without further purification, blood samples were collected for immunofluorescence studies and other biochemical like trace element and alkaline phosphates. The blood was centrifuged for 15 min at 1500 Xg and serum stored until used for assay.

- Determination of the serum immunoglobulin (IgG, IgA, IgM) was performed according to the single radial immunodiffusion technique of Mancini *et al.*, 1972⁽⁹⁾ kit taken from human company for clinical analysis.
- Stock standards of trace element (Zn, Cu) were of spectrosol trade mark; each of them with essential concentration of 100 mg/L, equipment that use for this assay was atomic absorption spectrophotometer, Shimadzu AAS AA-670 G, K.K – Japan.⁽¹⁰⁾
- AIP was determined by colorimetric determination of Alkaline phosphates activity by using the method of Kinoshita⁽¹¹⁾ by using kit of bio- Merieux, France, equipment that used was spectrophotometer model – CECL, France.

Results

A significantly lower mean of IgG level occurred in patients with psoriasis vulgaris ($P < 0.05$) and nonsignificant depression in both IgA, IgM level table⁽¹⁾.

In this table we can see that the value of IgG in psoriasis patients was (133.64 + 1.2 mg/ml) while in control group (156.38 + 3.2 mg/ml), while no significant value determined in IgM, IgA level [table (1)]. Serum of (Cu) level was found low in all patient with psoriasis (69.87 $\mu\text{g} / \text{dl}$) than in control (98.08 $\mu\text{g} / \text{dl}$). A significant value ($P < 0.05$) was found in level of Zinc, it was very high in psoriasis patient (120.9 + 22.65 $\mu\text{g} / \text{dl}$) as compared to control group (105 + 20.93 $\mu\text{g} / \text{dl}$) [table (2)] finally this search found that the serum of (AIP) was high in all patient (12.06 + 5.3 Iu/ml) if it compared with control group (8 + 1.60 Iu/ml), the difference was significant statistically⁽¹²⁾ [table (2)]

Discussion

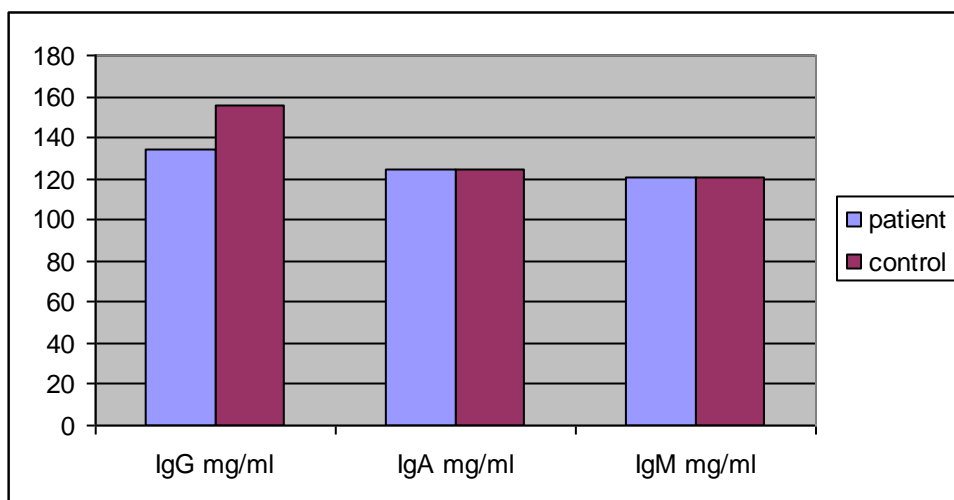
The relationship between levels of immunoglobulin, AIP and trace element is not widely reported and measuring the sera of IgG, IgA, IgM in patient with psoriasis demonstrated to a few studies that come to conform our study, such a result observed by C. Willim, Facp *et al.*⁽¹³⁾. They found that IgG level in patient with psoriasis was less than its level in healthy samples; so that our studies found that the IgG level was (133.64 + 1.2 Iu/ml) while in control samples was (156.38 + 3.2 Iu/ml) this result was very close with scientific opinion that the lower level of IgG in patients with skin disease might be to the result of general immuneresponse to an antigen responsible for the skin disorder (directly or indirectly)⁽¹⁴⁾. It is also possible that a change in the reactivity of lymphocyte cells is primary and the skin disease secondary; therefore the cause of psoriasis is not well understood by medical science⁽¹⁵⁾. The tendency to get psoriasis is inherited, it was thought that lymphocytes called T cells in the skin secrete growth factors which stimulate the rapid growth of skin cells⁽⁴⁾. A longitudinal study of serum Ig levels is required in larger series of patient with skin disease to demonstrate whether the serum Ig changes are primary and the skin lesions secondary⁽¹⁶⁾. An importance of trace metals like Cu, Zn, in psoriasis was accepted by many studies^(5,6,17). Both elements are known to influence each other metabolism for binding sites in the protein molecule of enzyme. Our result found that the serum copper was low (69.87 $\mu\text{g} / \text{dl}$) while in control (98.10 $\mu\text{g} / \text{dl}$) and this agrees with result of Mw. Kalff, S. Ogawa *et al.* (18). While another study

found that no significant result in level of copper and high level of zinc ⁽⁶⁾. Also varly H, et al found a good result as same as our research ⁽⁷⁾. They discus the result of high level of Zn and low level of Cu as a nature of population nutrition of dietary and in our results may be attributed to the dependence of Iraqi population nutrition on control protein grains and vegetable and with low meat fish and poultry products. The low level of Cu and high level of Zn in our patients is difficult to interpet. It may be due to the response of patients to the treatment or because that zinc plays an important role in reproductive physiology in both male and female because body synthesis is dependent on dietary zinc level and it is required for normal function of the hypothalamic pituitary – gonadl axis ⁽¹⁹⁾. A positive appears between high AIP, Zn but low level of Cu in psoriasis patient as compared with controls, it is t possible the role of Zn and AIP might be playing, but their involvement in antigens can not ruled. Finally our search suggests that globulins, Zn and AIP are the variable factors due to remission phase of psoriasis.

| No. of group | IgG mg/ml | IgA mg/ml | IgM mg/ml |
|--------------|--|--|--|
| Patient (55) | 134 Range 133.6 ± 1.2 Mean ± SD | 125 Rang 125± 3.8 Mean ± SD | 121 Rang: 121.09 ± 1.06 Mean ± SD |
| Control (26) | 156 Rang 156.38 ± 3.2 Mean ± SD | 124.6 Rang 124 ± 2,91 Mean ± SD | 121.03 120.990 ± 1.30 Mean ± SD |

Table (1) values of sera IgG, IgA, IgM in both control and patient

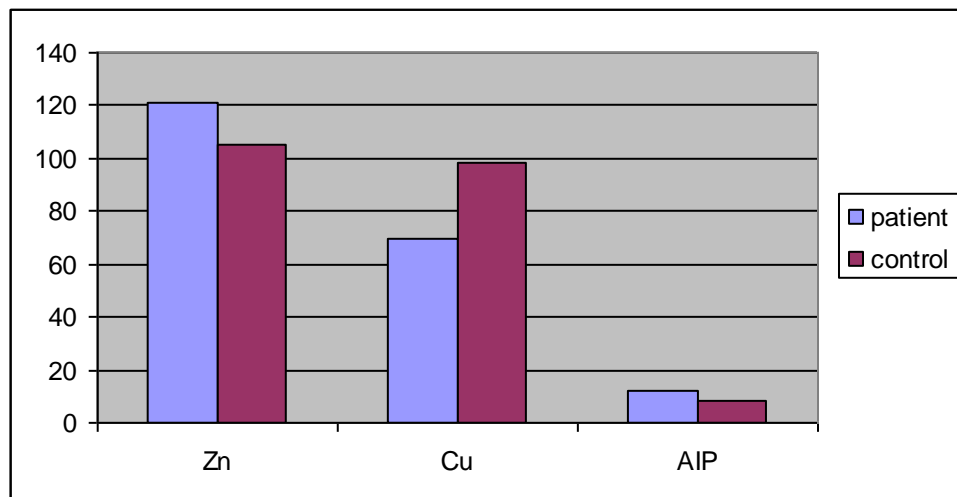
- IgG level was statically significant P < 0.05



| No. of group | Zn µg / dl | Cu µg / dl | AIP Iu / ml |
|--------------|---|---|--|
| Patient (55) | 121 Range 120.96 ± 22,65 Mean ± SD | 69.87 Range 70.2 ± 32.21 Mean ± SD | 12.06 Range 12.9 ± 5.31 Mean ± SD |
| Control (26) | 105 Range 105 ± 20.90 Mean ± SD | 98.10 range 98.08 ± 31.06 Mean ± SD | 8 Range 8 ± 1.601 Mean ± SD |

Table (2) values pf sera Zn, Cu, AIP in both patient and control

- All value was significant P < 0.05



References

- 1- J.A.A. Hunter J.A. sarin, M.V. Dahi, clinical dermatology, third edition 2002, page No. 48.
- 2- William D. James, Tomas. G. Berger, Dirk, M. Elston. Disease of the tenth edition, 2004, vol2, page, 806 – 812.
- 3- Schneider. C. Gurence, Anderson S.G., immunoglobulin levels in a topic skin disease.
- 4- Lai. A, Van – furth and group. The formation of immunoglobulin by human tissues 1998 chap (2) page 13 – 135.
- 5- Banpna – A Histochemical immunological and biochemical studies in skin disease. Clinical pathol Jornal. Vol. 3, No. 16 Pa. 37, 1992.
- 6- King E.J. P.R.N.J. clin pathil 1985, 7 322.
- 7- Varley H, Bolgert M. determination of Zinc and trace element in various skin diseases.
- 8- Milne D.B., Yen S.S. trace elements, text book of clinical chemistry (1994).
- 9- D.S. Rowe, B grab, SG Anderson international reference preparation for human serum immunoglobulin, 2001.
- 10- Molokia MM, portony B. Neutron activation analysis of trace element in dermatology disease 1998; 8: 309 – 13.
- 11- KIND P.R.N, king E.J. – estimation of plasma phosphates by determination of hydrolyzed phenol with amio – anti purin J. Clin path 1954.
- 12- Steel, R.G. and Torric, J.H. , principle and procedures of statistics. Mc Gaw – Hill k, New York (1986).
- 13- C. William Hank, M.D. Facp, J. Aimee, Dermatology In – review study guide, 2007, page 306.
- 14- Rostenberg A, Solomon L . infantile psoriasis and systemic disease. Arch dermatol 2002 Jul; 98 (1): 41 – 46 [pubmed]
- 15- Hinks J. young S, clayten B. Trace element status in enzema, psoriasis dermatol 1987; 12; 93 – 7.
- 16- Vergani C, Finzi, A. pigatto, P.D., biochemical studies of dermatology and bathology of its N. Engl. J. Med., 307, 1151 – 1152, 1997.
- 17- Kuller, L. H. , Ethinc difference in element with sAcne, psoriasis, aczema and netabolism of disease, 15, 109 – 113, 1978.
- 18- Kalff Mw, Ogawa S, trace metals in atopic dermatitis arch Dernatol 2005 Jun; 103 (6): 575 – 580 [ouomed]
- 19- Balylock wk, clendening we and et al. Normal immunologic reactivity in patient with the lumphoma mycosis fungoides cancer, 1975 Feb; 19 P; 12.