Original Article

Association of Prolactin with Psoriasis in Out-Patients at a Tertiary Care Hospital

Prolactin with Psoriasis in Patients

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ABSTRACT

Objective: Psoriasis is a serious, persistent, disfiguring, inflammatory, and proliferative skin disorder. Prolactin (PRL), an anterior pituitary gland secreted neuropeptide, has a number of physiological and biochemical actions. It has been suggested that Prolactin may be involved in psoriasis development. Therefore, the study could help to look for hyperprolactinemia in psoriasis patients and thus take appropriate treatment measures to address the issue. The study's basic objective is to determine the mean amount of serum prolactin in psoriasis patients.

Study Design: Observational / cross sectional study

Place and Duration of Study: This study was conducted at the outpatient's department (OPD) of Department of Dermatology, LUMHS Jamshoro & LMU hospital Sindh Pakistan from October 2015 to March, 2016.

Materials and Methods: This research included 42 confirmed cases of psoriasis. All these patients were tested by the ELISA technique of taking 3cc venous blood sample in a disposable syringe for serum prolactin level and sent it for analysis to the laboratory. On pre-designed pro forma, the patient data are collected.

Results: The average age was 37.71± 10.68 years. There were 40.48% male and 59.52% female. Mean serum prolactin level in patients of psoriasis was 44.21± 14.73 ng/ml (95%CI: 39.61 to 48.80).

Conclusion: The above findings indicate that the amount of serum prolactin may play a significant role in pathophysiology of psoriasis. In patients with psoriasis, we experienced a significant rise in serum PRL. We therefore could say that PRL can be used as a useful psoriatic behavioral biological marker.

Key Words: Psoriasis, Serum prolactin level, Hyperprolactinemia

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INTRODUCTION

Psoriasis is a severe persistent, incapacitating, aggressive, and proliferative skin disorder. It is medically characterized by plaques that are dark, scaly, clearly defined, indurated, present especially on extender surfaces and scalp.[1]It is also characterized by keratinocyte hyperproliferation and T cell aggregation in the psoriatic lesions involving epidermis and dermis.[2]The mean worldwide prevalence of psoriasis is considered to be around 2%.[3]Psoriasis is a serious, long-lasting (chronic) condition, there is no cure, although therapies for psoriasis can provide some relief.[4]

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A neuropeptide secreted by the anterior pituitary gland, prolactin (PRL), has a number of physiological and biochemical activities. It was involved as an active immunomodulator and through various receptors this exerts a proliferative effect on cultivated human keratinocytes.[2]Hyperprolactinemia has been reported to occur frequently in psoriasis patients and it has been suggested that PRL may promote psoriasis development.[5] The presence of PRL receptors on epidermal keratinocytes supports the hypothesis that PRL may play a role in the etiopathogenesis of psoriasis.[6]Elevated serum prolactin levels can play a rolein in-vivo keratinocyte hyperproliferation, the hallmark of the cycle of psoriasis disease.[7]There are three recent studies on this basis reporting an independent correlation of increased serum PRL levels with psoriasis.[8]The interest in investigating the "psoriasis-PRL link" should be reinvigorated. El-Chateeb and so on.[9]noted that blister fluid PRL levels obtained from skin-active psoriasis patients are significantly higher than those obtained from uninvolved or healthy skin in blister fluid.

The study was carried out to determine the association between the levels of serum prolactin and psoriasis to investigate the relationship between Prolactin and psoriasis growth. The research will therefore help to check for hyperprolactinemia in patients with psoriasis

and thus take appropriate treatment steps and aid with proper diagnosis.

MATERIALS AND METHODS

This is an observational cross sectional study, conducted in outpatient's department (OPD) of Department of Dermatology, LUMHS Jamshoro & LMU hospital Sindh Pakistan. A non-probability consecutive sampling technique was used for this study. The confidence interval was 95%, the margin of error 3, n=42 patients, according to the observed mean serum prolactin rate= 49.590. This study was carried out on patients with psoriasis who attended the outpatient department (OPD) of the Dermatology Department, Jamshoro & LUMHS Hyderabad after approval by the Ethics Committee. The informed consent from all patients was read and explained to the patient before they were registered for the analysis. All these patients were evaluated by the ELISA technique of taking 3cc venous blood sample in a disposable syringe for their serum prolactin level and sent it for analysis to the laboratory. Patients' serum prolactin level was reported. All patient data was entered and analyzed using version 17.00 of SPSS. For age and serum prolactin, the mean and standard deviation (SD) were calculated. For patients with psoriasis, the incidence and percentage were assessed for gender distribution of elevated prolactin. It has been accredited with regard for age and gender, post-stratification variance analysis and an independent sample t-test has been applied to compare mean increased prolactin in psoriasis patients.

RESULTS

This study included 42 diagnosed cases of psoriasis. Patient age distribution isshown in Figure-1.The average age and duration of disease as shown in Table-2 was 37.71 ± 10.68 years and 5.21 ± 1.80 months. In this study, 40.48% (17/42) of the 42 cases were male and 59.52% (25/42) were female, as shown in Figure 2.

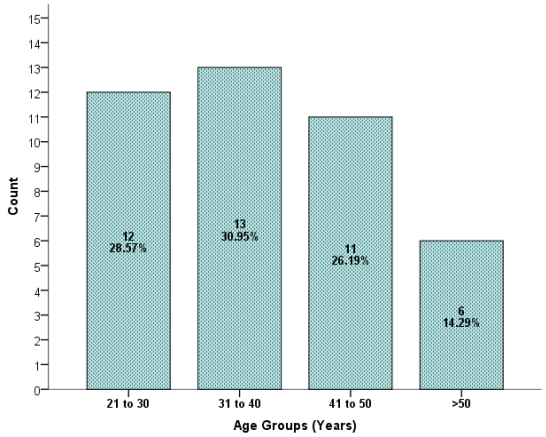

Figure No.1: Distribution of Patients age(n=42)

In patients with psoriasis, the mean serum prolactin rate was 44.21± 14.73 ng / ml (95% CI: 39.61 to 48.80) as shown in Table-1.As shown in Table-3, the mean serum prolactin level in psoriasis patients was high in all age groups and not significant among different age groups (P = 0.359). In patients with psoriasis, the mean serum prolactin rate was 43.38±15.26 ng / ml in male and 44.70 ± 14.66 ng/ml in female patients, which is not important as shown in Table-4. Furthermore, Table-5 gives a comparison of the mean serum prolactin level in psoriasis patients with the length of the disease.

Table No.1: Descriptive Statistics of age and Duration of Disease(n=42)

Statistics	Age (Years)	Duration of disease (months)
Mean ± SD	37.71± 10.68	5.21 ± 1.80
95% Confidence Interval	34.39 to 41.04	4.65 to 5.78
Mean (IQR)	36.5 (18)	5 (2)
Minimum-Maximum	21-58	2-10

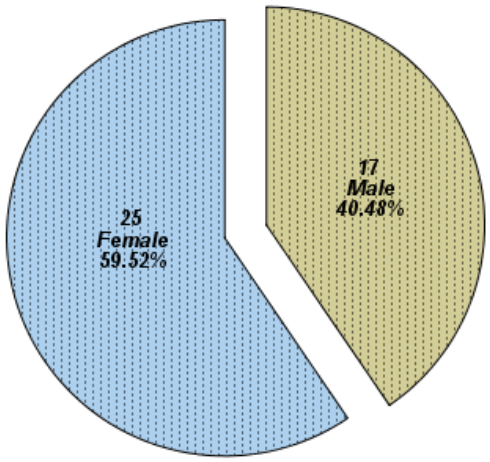

Figure No.2: Distribution of the PatientsGender (n=42)

Table No.2: Mean Serum Prolactin Level in Patients of Psoriasisn=2

Statistics	Raised serum Prolactin Level (ng/ml)
Mean ± SD	44.21± 14.73
95% Confidence Interval	39.61 to 48.80
Mean (IQR)	48.95 (28.8)
Minimum-Maximum	16.8-59

Table No.3: Comparison of mean serum Prolactin level in Patients of Psoriasis among different Age Groups n=42, ANOVA Applied

Age Groups	N	SERUM PROLACTIN LEVEL		P-Value
		Mean	SD	
21 to 30	12	44.19	16.43	0.359
31 to 40	13	43.95	14.13	
41 to 50	11	39.63	16.61	
>50	6	53.18	3.43	

Table No.4: Comparison of mean serum Prolactin level in Patients of Psoriasis between Genders, n=42, Independent Sample t-Test Applied

Gender	n	Serum Prolactin Level		P-Value
		Mean	SD	
Male	17	43.48	15.26	0.79
Female	25	44.70	14.66	

Table No.5: Comparison of mean serum Prolactin level in Patients of Psoriasis with respect to Duration of Disease, n=42, Independent Sample t-test Applied

Duration of disease (months)	n	Serum Prolactin Level		P-Value
		Mean	SD	
2 to 5 months	27	42.63	15.26	0.36
6 to 10 months	15	47.04	13.78	

DISCUSSION

Psoriasis is an autoimmune disease described by keratinocyte hyperproliferation and T-cell aggregation in psoriatic lesions of the epidermis and dermis.[10]There is some evidence that when hormonal changes such as puberty and menopause occur, psoriasis may intensify in ages and may also worsen or strengthen throughout childbirth.[11]There are several physiological activities of Prolactin (PRL), a neuropeptide secreted by the anterior pituitary gland. As an active immunomodulator, it has been involved and this has a proliferative effect on cultivated human keratinocytes through different receptors. Several research showed an increase in psoriasis serum PRL levels and an increase in psoriasis when a prolactinoma develops.[12]Prolactin functions in both the epithelial development of the skin and the immune system of the skin as a neuroendocrine modulator. It is thought to be integrated into a multilevel endocrine-immune interaction along the" brain skin axis'.' Stress has been reported to cause and exacerbate psoriasis, so it could be a connection between prolactin and pathogenesis of the disease.[13]Prolactin is produced from extrapituitary sources, including the hair, and has been partly traced to the skin for the involvement of keratinocytes, fibroblasts and migratory lymphocytes. Most skin cell populations have shown prolactin and prolactin receptor expression, including keratinocytes, fibroblasts, sweat and sebaceous glands.[14,15]

This research included 42 confirmed cases of psoriasis. The average age and duration of the disease was 37.71± 10.68 years. 40.48% (17/42) of the 42 cases were male and 59.52% (25/42) were female. Maryam Azizzadeh et al,[16] who reported 40% of males and 60% of females in their study, reported similar predominance of female gender. In our sample, mean serum prolactin was 44.21± 14.73 ng / ml (95 percent CI: 39.61 to 48.80) in patients with psoriasis. It is also observed that the mean serum prolactin level was high in all age groups in patients with psoriasis. Regana and Millet, 2000 reported three cases of females with plaque type psoriasis that correlated severity and extent of skin lesions with the development of prolactinoma.[17] Bromocriptin was used in all three patients. We also had normalization of the PRL level and regeneration of the psoriatic lesion.In 1981, Weber et al.[18–20]observed high serum levels of HGH in psoriasis patients[20]and subsequently confirmed HGH-producing pituitary gland hyperplasia in all 10 post-mortem psoriatic patients.[19,20]Buskila et al.[21]described a woman with psoriatic arthritis who had markedly improved skin and joint disease after bromocriptine (a dopamine agonist who blocked bromocriptine). It is notworthy that PRL serum levels in psoriasis are rarely reported.On the other side, Azizzadeh et al.[16]found that although the serum PRL levels measured by ELISA in 30 psoriatic patients were not significantly higher than the control group having 30 controls using PishtazTeb package. Gorpelioglu et al.[22]analyzed PRL levels in 39 patients with psoriasis and compared them to 36 controls. Nine patients and five controls raised the PRL levels significantly, but below 100 ng / ml. There was no significant difference in the serum PRL levels between patients and controls.

CONCLUSION

The above findings indicate that the amount of serum prolactin may play a role in psoriasis pathogenesis and its progression. This feature may be a cause and/or result of psoriasis pathology for patients with psoriasis. In this study, where Psoriasis has been found linked to increase in serum PRL levels, we assume that for psoriatic behavior, PRL can be a useful biological marker. To validate our observations and explain the pathogenic role of PRL in psoriasis, further research should be carried out with larger cohort in population with different ethnic groups.

Author's Contribution:

Concept & Design of Study: Nadia Rajper

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Data Analysis:	Tanweer Ahmed Shaikh, Muhammad Yaqoob Shahani, Sanam Pirzado
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Final Approval of version:	Nadia Rajper

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Badad AS, Badad SA. Efficacy and safety of azathioprine in psoriasis. Int J Res Dermatol 2019;5(3):471.
2. Kato A, Sheeren F, Amel S, Al E. Serum level of prolactin in psoriatic patients. Egypt Dermatol Online J 2012;8:1–12.
3. Gudjonsson JE and JTE. Psoriasis: epidemiology. Clinics in Dermatol 2007;535-546.
4. Smith J, Cline A, Feldman SR. Advances in Psoriasis. South Med J 2017;110(1):65–75.
5. Khatri G, Mahajan VK, Mehta KS, Sharma KK, Bhushan S, Chauhan PS. Serum prolactin levels in patients with psoriasis: Results of a pilot study. Ind J Med Res 2017;145(FEBRUARY):250–2.
6. Roman II, Constantin AM, Marina ME, Orasan RI. The role of hormones in the pathogenesis of psoriasis vulgaris. Clujul Med 2016;89(1):11–8.
7. Borba VV, Sharif K, Shoenfeld Y. Prolactin and the Mosaic of Autoimmunity. Mosaic Autoimmun 2019;435–47.
8. Arul S, Dayalan H, Jegadeesan M, Damodharan P. Induction of differentiation in psoriatic keratinocytes by propylthiouracil and fructose. BBA Clin 2016;6:82–6.
9. Rachakonda TD, Schupp CW, Armstrong AW. Psoriasis prevalence among adults in the United States. J Am Acad Dermatol 2014;70(3):512–6.
10. Mahil SK, Capon F, Barker JN. Update on psoriasis immunopathogenesis and targeted immunotherapy. Semin Immunopathol 2016; 38(1):11–27.
11. Mashaghi A, Marmalidou A, Tehrani M, Grace PM, Pothoulakis C, Dana R. Neuropeptide substance P and the immune response. Cell Mol Life Sci 2016;73(22):4249–64.
12. Langan EA, Fink T, Paus R. Is prolactin a negative neuroendocrine regulator of human skin re-epithelisation after wounding? Arch Dermatol Res 2018;310(10):833–41.
13. FJ T, OL R. The Guardians of the Skin Immune System. Int J Clin Dermatol Res 2016;1.
14. Foitzik K, Langan EA, Paus R. Prolactin and the skin: A dermatological perspective on an ancient pleiotropic peptide hormone. J Invest Dermatol 2009;129(5):1071–87.
15. Barrett R, Narasimhulu CA, Parthasarathy S. Adrenergic hormones induce extrapituitary prolactin gene expression in leukocytes-potential implications in obesity. Sci Rep 2018;8(1).
16. Azizzadeh M, Malek M, Amiri M, Ghorbani R. Does Prolactin Indicate Severity of Psoriasis? 2009.
17. Montgomery PR. Psoriasis in Association with Hypocalcæmia. J R Soc Med 1964;57(12):1128–9.
18. AM Belovol VN. State of hormones and neuromediators within energy metabolism in patients with advanced and complicated psoriasis conditions.
19. Syro LV, Rotondo F, Serna CA, Ortiz LD, Kovacs K. Pathology of GH-producing pituitary adenomas and GH cell hyperplasia of the pituitary. Pituitar 2017;20(1):84–92.
20. Saini PK, Yadav D, Badyal R, Jain S, Singh A, Vijay M. Serum Prolactine Level in Patients of Psoriasis Vulgaris and Its Correlation With Disease Severity: a Case-Control Study. Int J Med Biomed Stud 2019;3(6).
21. Borba VV, Zandman-Goddard G, Shoenfeld Y. Prolactin and autoimmunity: The hormone as an inflammatory cytokine. Best Pract Res Clin Endocrinol Metab 2019;101324.
22. Gorpelioglu C, Gungor E, Alli N. Is prolactin involved in etiopathogenesis of psoriasis? J Eur Acad Dermatol Venereol 2008;22(9):1135–6.