

EFFECT OF HEMODIALYSIS ON CIRCULATING HORMONES IN PSORIASIS

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In eight patients having extensive psoriasis, treated with hemodialysis, serum levels of LH, FSH, testosterone, T_3 , T_4 , TSH, prolactin, insulin and cortisol were estimated before and after clinical improvement. No differences were observed in hormone levels before and after dialysis. Serum prolactin levels which were high to begin with, remained so even after dialysis although the value had decreased slightly.

Key words : Psoriasis, Hemodialysis, Hormones.

Changes in circulating hormones and dynamics of their secretory pattern have been recorded in patients with renal failure following hemo and peritoneal dialysis.¹ In addition to hormones, hemodialysis is also known to wash several toxins from the subjects undergoing the procedure. As of today, hemodialysis is considered experimental in the management of patients with severe psoriasis. The possible elimination of a "psoriatic toxin" is expected to improve the patient's clinical condition. Absorption of some 'beneficial substance' and a possible change in the hormonal milieu brought about by the stress of hemodialysis may contribute to the remission of lesions in these patients. It is also possible that the improvement after dialysis could only be the effect of a 'new' treatment (placebo effect) and the new technique of 'purifying blood' may provide a psychologically satisfying form of therapy. The therapeutic evaluation of dialysis is however difficult in these patients because of the unpredictable cyclical course of psoriasis. The present study was undertaken to record the changes in the circulating hormones in patients of psoriasis before and after hemodialysis.

Materials and Methods

Eight adults with extensive psoriasis were randomly selected for the study. The purpose was explained and an informed consent was obtained. None of the patients was immunosuppressed with corticosteroids or antitumour agents, or on oral contraceptives for at least three months prior to the initiation of the study.

Two venous samples of 15 ml each were collected at 15 minute intervals before the beginning of dialysis. The procedure was carried out with Kill's dialyser using 1.0 m² surface area with cuprophane 150 PM membranes having a pore radius of 25A° and middle molecular clearance ranging from 5 to 40 ml mm³. Twice a week dialysis was done lasting 6 hours in each sitting. Two more samples were drawn after at least three dialysis sessions when the patients had experienced improvement based on the clinical observation of decrease in induration, scaling and erythema.

The sera were separated at room temperature and stored at -20° C for hormone assays. LH, FSH, testosterone, T_3 , T_4 , TSH, prolactin, insulin and cortisol were quantitated by sensitive and specific radioimmunoassays. All samples were processed in duplicate in the same assay to minimise the inter-assay variation. The coefficient of intra-assay variation for all hormones was under 5%. The cross sectional data was analysed statistically using the student 't' test.

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Table I. Hormonal levels in 8 psoriatics and 50 normal controls.

Hormone	Mean values of the hormones in		
	Normal controls	Psoriasis patients	
		Before dialysis	After dialysis
LH iu/L	3.23 ± 2.54	2.96 ± 0.94	3.14 ± 1.98
FSH iu/L	2.3 ± 1.3	3.9 ± 0.33	2.96 ± 1.13
PRL/ mIU/L	516.75 ± 137.41	1078.80 ± 572.04	816.80 ± 486.0
TSH uu/L	3.12 ± 0.7	2.25 ± 0.38	3.33 ± 0.62
Cortisol nmol/L	54.0 ± 6.0	41.92 ± 6.51	42.00 ± 5.80
Testosterone nmol/L	1.51 ± 0.35	1.8 ± 0.6	1.23 ± 0.71
T ₃ ng/L	1.0 ± 0.25	1.2 ± 0.41	1.23 ± 0.39
T ₄ ng/L	95.9 ± 19.2	101.0 ± 23.0	98.2 ± 20.2
Insulin uU/ml	13.0 ± 5.0	15.0 ± 2.0	13.0 ± 3.0

Results

All patients tolerated the procedure well. Values of circulating hormones assayed are given in table I. All the values were within the normal range before and after the dialysis, except for a marginally elevated PRL before dialysis which was lowered following the procedure.

Comments

Dialysis has been reported to be an effective therapeutic measure in patients with psoriasis, with or without uremia.^{2,3} The following factor(s) are considered to operate in dialysis induced improvement of psoriasis, (1) removal or infusion of pathologic or physiologic substance(s), (2) removal of an inhibitor to epidermal chalone, (3) stimulation of intracellular cyclic nucleotide feed-back system.⁴ The nature of toxin which might be eliminated by dialysis and not by the kidneys has not yet been identified. Chemotaxis of neutrophils is known to be depressed after dialysis.⁵ Circulating levels of several polypeptide hormones, e. g. insulin, parathyroid hormone, lysozyme and ribonuclease affected after peritoneal dialysis⁴ are unlikely to be dialysed through the cuprophane 150 PM membrane.

Alterations in the circulating hormones in patients with psoriasis are not many. Holzman

et al⁶ reported low dehydroepiandrosterone (DHEA) both intra and extracellularly. Serum testosterone levels however have been found to be normal in patients of psoriasis.^{6,7}

In this study, we failed to document any significant alterations in circulating levels of LH, FSH, testosterone, T₃, T₄, TSH, insulin and plasma cortisol either before or after the procedure. Elevation of prolactin was however significant in the patient group and it was marginally lowered following hemodialysis. Lowering of prolactin with hemodialysis in patients of renal failure is well documented.⁸ The cause of elevated prolactin in psoriasis remains unclear. Stress of the disease could be a possible factor. However, enhanced peripheral aromatisation of androstenediol and other weak androgens to estradiol and the estradiol mediated higher prolactin secretion remains a possibility.

A few studies have shown abnormal secretion of growth hormone and its related peptide, the epidermal growth factor in these patients.⁹ In fact, Ghirlanda et al¹⁰ demonstrated improvement in psoriasis by somatostatin analogues with evident suppression of epidermal growth factor and possibly other pituitary hormones. This finding of elevated levels of epidermal growth factor calls for a prospective study using

bromocriptine in the management of this condition.

Further, we do not think that the stress induced hormone production including that of corticosteroids leads to subsidence of psoriasis. Lack of significant alterations in their level rules out any of their positive role.

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