

SERUM URIC ACID, CALCIUM AND PHOSPHORUS IN PSORIASIS

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Summary

Fifty (50) patients with different types of psoriasis and 25 controls were studied. 7 patients with psoriasis had elevated serum uric acid levels without any relation to the extent of skin involvement. All remaining psoriatics and controls had normal levels of serum uric acid, calcium and phosphorus.

KEY WORDS: Psoriasis, serum uric acid, calcium and phosphorus.

Introduction

Psoriasis is a common dermatosis of unknown etiology. The characteristic pathological process expresses increased mitotic activity of the basal cell layer resulting in rapid epidermal cell turnover¹, with the 28-day normal epidermal cell cycle reduced to 5-days²⁻⁶. The mitotic activity of cells involves purine metabolism, the end product of which is uric acid^{7,8}. It is therefore, likely that the increased serum uric acid levels in psoriatics are due to the increased mitotic activity of the cells. Thus a direct relationship between the extent of skin involvement and serum uric acid levels was observed^{7,1,9}. However, such a relationship has not been observed by other workers⁸. Similarly, the significance of total serum calcium and phosphorus in

psoriasis is yet to be established. Hence, this study was conducted to know the status of serum uric acid, calcium and phosphorus levels in psoriasis, and the relationship of these to the severity of the disease.

Material and Methods

Fifty untreated psoriasis patients, comprising 40 males and 10 females were inducted to the study. Their ages varied from 20-50 years. The diagnosis in each case was made on the basis of clinical examination and confirmed by microscopic pathology. The cases were identified as nummular (88%), guttate (2%), erythrodermic (6%), flexural (2%) and generalised pustular (2%). Other causes which could alter the levels of serum uric acid, calcium and phosphorus were ruled out through history, clinical examination and relevant investigations. The serum uric acid, total serum calcium and inorganic phosphorus levels were determined by methods of Carraway⁴, Clark and Coliip¹⁰, and Fiskey and Subbarow¹¹ respectively. The results thus obtained were evaluated and compared to that of 25 controls.

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Observations

The serum uric acid levels in 25 controls and 50 psoriatic patients are shown in Table 1. Serum uric acid levels were elevated in 7 (14 %) ranging from 3-11 mg% (mean = 6.07 mg%) in comparison to the controls where the range was 2.5-7.5 mg% (mean = 5.34 mg%). Table 2 shows elevated serum uric acid levels in relation to the degree of skin involvement. No significant correlation was found between the extent of skin involvement and serum uric acid levels (p 0.05).

TABLE 1
Mean serum uric acid levels in 50 psoriatics and 25 controls

Cases	Mean serum levels (mg/100 ml)	Uric acid levels (mg/100 ml)
	Psoriatics	Controls
Males	6.5 (3-11)*	5.8 (3-7.5)*
Females	4.35 (3-5.5)*	3.5 (2.5-5.5)*
	6.07 (3-11)*	5.34 (2.5-7.5)*

* range of serum uric acid
P 0.05

TABLE 2
Skin surface involved and serum uric acid levels

Percentage of skin involved	Number of patients	Patients with elevated levels	
		No.	%
Less than 25	10	3	30
25-50	14	1	7.2
50-75	16	1	6.2
More than 75	10	2	20
Total	50	7	

P > 0.05

Levels of total serum calcium in psoriatics is shown in Table 3 and was found to be within normal limits, ranging from 8.8-10.4 mg% (mean = 9.8%). All control subjects showed normal serum calcium levels in the range of 9.0-10.6 mg% (mean = 9.4 mg%).

TABLE 3
Mean total serum calcium levels in 50 psoriatics and 25 controls

Cases	Mean total serum calcium (mg/100 ml)	
	Psoriatics	Controls
Males	9.9 (9.2-10.4)*	9.5 (9.2-10.6)*
Females	9.4 (9.0-10.2)*	9.2 (9.0-9.6)*
	9.8 (9.0-10.4)	9.4 (9.0-10.6)

* range of serum total calcium
p > 0.05

Table 4 shows levels of serum inorganic phosphorus in psoriatics and controls. In psoriatics, phosphorus levels varied from 2.8-3.6 mg% (mean = 3.2 mg%). In control subjects the range was 2.76-4.4 mg% (mean = 3.4 mg%).

TABLE 4
Mean serum inorganic phosphorus levels in 50 patients of psoriasis and 25 controls

Cases	Mean serum inorganic phosphorus (mg/100 ml)	
	Psoriatics	Controls
Males	3.16 (2.8-3.2)*	3.37 (2.76-4.0)*
Females	3.36 (2.84-3.6)*	3.5 (2.96-4.4)*
	3.2 (2.8-3.6)	3.4 (2.76-4.4)

* range of serum inorganic phosphorus
p > 0.05

Discussion

Uric acid is an end product of purine metabolism. The levels of serum uric acid are altered either because of defective renal excretion or because of over production due to some metabolic defects⁷. Increased purine metabolism occurs in psoriasis because of increased epidermal cell turnover⁷. Hence, increased epidermal cell turnover was put forward as a plausible explanation

for increased serum uric acid levels in psoriatics and this conclusion was based on the reports of a direct relationship between the extent of skin involvement and serum uric acid levels^{7,1,9}. Increased serum uric acid levels have also been reported by other workers who did not observe any direct relationship between serum uric acid levels and the extent of skin involvement⁸. Thus, increased epidermal cell turnover was ruled out by these workers as a cause for increased serum uric acid levels. In our study, 14% of patients had elevated serum uric acid levels. The elevated levels of serum uric acid however had no relationship to the severity or extent of the disease. This finding, is in contrast to that of increased epidermal cell-turn-over as the cause of elevated serum uric acid levels in psoriatics. According to some, genetic predisposition could be a reasonable explanation for hyperuricemia in psoriasis patients⁹. Thus, the issue is still fraught with speculations.

Total serum calcium alterations in psoriasis patients have been varyingly reported, showing thereby that an increase, decrease or a normal level may be seen¹².

A study of another group of workers showed the levels of total serum calcium to be decreased in 4.9% of psoriatics and this was attributed to severe episode of the disease and associated steatorrhoea¹³. However, the present study revealed normal serum calcium in all 50 patients.

Serum phosphorus levels in cases of psoriasis have been reported to be normal even in the presence of decreased total serum calcium¹³. In our study also, the serum inorganic phosphorus levels were in the normal range.

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