

# Hypertension Associated To Urolithiasis

S Ortega, J Vizcaino

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## Abstract

In a group of 900 hypertensive patients we analyze the prevalence and the treatment response in the sub-group with urolithiasis. The prevalence of urolithiasis was 13,7%, and the prevalence of urolithiasis by hypercalciuria and/or hyperuricosuria was 12.3%. The control level to the treatment in the last sub-group with thiazides and/or allopurinol was 59,5%. The hypertensive patients with this type of urolithiasis and without hypertension control with this treatment were the intolerant patients to thiazides and/or allopurinol (6,3%) and the obese hypertensive patients (34,2%). These data help to explain why the thiazide diuretics have been the antihypertensive drugs that have given better results in the ALLHAT study and they still are continuing in the current recommendations like first line antihypertensive drugs

## BACKGROUND

Observational studies suggest the hypertension and urolithiasis association could be related in its etiology, pathogenesis and treatment<sup>1,2,3,4,5</sup>. It would determine that we simultaneously treated the hypertension, the urolithiasis, and the potential osteoporosis and dental alterations<sup>6,7</sup> using thiazide diuretics and allopurinol. These problems (urolithiasis, osteoporosis and dental alterations) undergo with high prevalence and in a combined way in the hypertensive patients.

We reviewed the association of hypertension and urolithiasis in an office, and we suggest could give the basis for explain the results of ALLHAT study<sup>8,9,10</sup>.

## PATIENTS AND METHODS

In an hypertension office we analyze the sub-group of hypertensive patients with urolithiasis associated to hypercalciuria and/or hyperuricosuria. Hypertension was defined as a blood pressure of at least 140/90 mm Hg or inferior if antihypertensive medication was used.

This study corresponds to health area with a population of 425000 inhabitants. Of 900 hypertensive patients 124 (13,7%) have presented urolithiasis on the basis of history and/or abdominal ultrasonic study. Of 124 hypertensive patients with urolithiasis, 111 (12,3%) presented hypercalciuria and/or hyperuricosuria. A general protocol was practiced at this 124 hypertensive patients with urolithiasis, which it included SMA (twice) of 22

determinations, urinary sediment and in the urine of 24 hours creatinin, calcium, uric acid, oxalate and citrate.

Hyperparathyroidism was discarded with levels of calcemia, phosphorus and parathyroid hormone. At a sub-group of 111 hypertensive patients without urolithiasis was practiced the same protocol and was considered control of the sub-group with urolithiasis with hypercalciuria and/or hyperuricosuria. We valued the prevalence and the response to the treatment with the association thiazides and/or allopurinol to the sub-group of hypertensive patients associated to urolithiasis with hypercalciuria and/or hyperuricosuria. The data was analyzed with informatic program RSIGMA.

## RESULTS

Of the 124 hypertensive patients with urolithiasis 111 presented hypercalciuria and/or hyperuricosuria, 3 with hypocitraturia and the rest other alterations. The average age of the urolithiasis with hypercalciuria and/or hyperuricosuria was of  $46.2 \pm 11.2$  years. Of them 61 (55%) was men. In the sub-group with hypercalciuria and/or hyperuricosuria the daily average elimination of calciuria was of  $338 \pm 3$  mg (normal < 260 mg per 24 hours), being in the interval 803-269 mg. The average elimination of uric acid in urine of 24 hours was of  $763 \pm 9$  mg (normal < 10 mg/kg/per day), being included in the interval of 248-1465 mg. The calciuria ( $226 \pm 2$ ) and the uricosuria ( $563 \pm 6$ ) in the sub-group of 111 hypertensive patients without urolithiasis were inferior to the sub-group with urolithiasis ( $p < 0,05$ ).

Seven (6,3%) cases affected of hypercalciuria and/or

hyperuricosuria did not tolerate the association thiazides-allopurinol. On the rest (104 hypertensive patients), in 102 patients was controlled the hypercalciuria and/or hyperuricosuria with thiazides and/or allopurinol and in 66 (59,5%) the hypertension was controlled with this association. Two patients which persisted with hypercalciuria and/or hyperuricosuria continued with clinical of urolithiasis. The 38 (34,2%) patients without control of hypertension were obese with body mass index superior to 30 kg/m2.

A familiar history was detected in 48 (43,2%) hipertensive patients with urolithiasis hypercalciuria and/or hyperuricosuria.

**DISCUSSION**

With this data we think that the hypertension-urolithiasis association would be considered in the initial evaluation of hypertensive patients<sub>3,4,5</sub>. On this way we value make to all hipertensive patients an abdominal ultrasonic study, since the most of secondary causes of hypertension are at level of suprarrenal glands or in the urinary system; it's including the urolithiasis. We are reviewing these results of sequential way, in the hypertension office, and we are watching the elevated prevalence of urolithiasis-hypertension association persists superior to 12% along the study<sub>11</sub>. We can assume that this's one explanation to thiazide diuretics are very useful in the treatment of hypertension. It would be important comment that the loop diuretics, increasing calciuria, probably would lose the therapeutic effects of thiazide (Table I). On this way the loop diuretics would not be in the antihypertensive initial treatment, unless cardiac or renal insufficiency exists.

**Figure 1**

Table 1

Therapeutic effects of thiazide diuretics:
1.- Antihypertensive.
2.- Diuretic.
3.- Prevention of urolithiasis.
4.- Prevention of Osteoporosis.
5.- Prevention of dental alterations.

Recently a paper has been published<sub>12</sub> contradicting to the study ALLHAT, and that it's showing the contradictions in which the medical Literature is immersed.

As a summary we can conclude: 1. - The hypertension associated to urolithiasis could be considered like specific form of secondary hypertension, in probably relation to tubular kidney anomalies<sub>13</sub>, cause of hypercalciuria and/or hyperuricosuria; 2.- In the presence of hypertension

associated to hypercalciuria and/or hyperuricosuria urolithiasis the combination of thiazides and/or allopurinol controls both alterations (hypertension and urolithiasis) in the most of the cases; 3. - The hypertensive patients with urolithiasis which require other associations of antihypertensive drugs to the thiazides for the hypertension control probably have other etiologies associated to this metabolic anomaly, like obesity 4.- The familiar association of hypertension-urolithiasis represents one more reason in hereditary basis of the hypertension.

**CORRESPONDENCE TO**

Saturnino Suarez Ortega Urbanización El Arco 16. La Atalaya. 35307 Santa Brigida Las Palmas. Spain. Tf (34-28)928430263 E.mail: drsuarez@hotmail.com

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**Author Information**

**Saturnino Suarez Ortega, M.D.**

Internal Medicine, Hospital General de Gran Canaria Dr. Negrin

**Jeronimo Artiles Vizcaino, M.P.**

Internal Medicine, Hospital General de Gran Canaria Dr. Negrin