Urine Osmolarity and the Excretion of Prostaglandin E₂ in Man

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1,0001
500-
100 200
PGE₂(pg/ml)

51

4-
Δ
3-
2-
1-0-

[\Ind\basal](#)

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1 1
100
200 PGE₂(pg/ml)

Fig.1. Correlation between urine osmolarity (A), urine flow rate (B) and urinary concentrations of PGE₂ during 11 h of fluid deprivation in 2 healthy subjects under basal conditions (o, Δ) and following pretreatment with indomethacin (IND; •, A).

We have studied urine flow rates (ml/min), urine osmolarity (mosm/l), and the urinary concentration (pg/ml) and excretion rates (ng/2 h) of prostaglandin E₂ (PGE₂) in 2 healthy subjects after an oral water load (1,000 ml) and during subsequent fluid deprivation for 11 h. Both with and without inhibition of endogenous prostaglandin synthesis with indomethacin (150 mg/day for 3 days) a rise in the concentration of urinary PGE₂ was seen during anti-diuresis in parallel with urinary osmolarity (without indomethacin: $r = 0.85$, $p < 0.001$; during indomethacin: $r = 0.91$, $p < 0.001$; fig. 1A) and in reciprocity with urine flow rate (without indomethacin: $r = -0.73$, $p < 0.01$; during indomethacin: $r = -0.68$, $p < 0.01$; fig. 1B). No correlation was seen between urine flow rate and the excretion of PGE₂ during antidiuresis.

High urine flow rates (> 4 ml/min) increase prostaglandin excretion in a nonspecific manner in the presence of unchanged prostaglandin concentrations [Kirschenbaum and Serros, 1980]. In addition, the excretion of PGE₂ seems to be unchanged during antidiuresis in the presence of a rise

in PGE₂ concentrations. The latter may be induced either by endogenous ADH or simply by prolonged contact time in a diffusion-regulated system [Kirschenbaum and Serros, 1980].

Thus studies dealing with determinations of urinary PGE₂ in man need to define the respective state of hydration and to report both the concentrations and the excretion rates of PGE₂, since omission of either parameter may lead to misinterpretation.

References

Kirschenbaum, M. A.; Serros, E. R.: Effects of alterations in urine flow rate on prostaglandin E excretion in conscious dogs. *Am. J. Physiol.* F 238: 107–111 (1980).