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Title: Characteristics of increased urine flow during a dry saturation dive at 31 ATA

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Abstract: Three male divers were subjected to a 7-day dry saturation dive at 31 ATA (New Seatopia). Urine samples were collected for measurements of electrolytes and creatinine for glomerular filtration rate (GFR) 5 times daily, at 3-h intervals during daytime (0700-2200 h) and once at night (2200-0700 h). Collections were taken for 2 days before (predive 1 ATA air), 7 days during 31 ATA exposure, and during 10 days of decompression and for 2 days at postdive 1 ATA air. Blood samples were taken after overnight fasting at each of the dive periods for measurements of atrial natriuretic factor (ANF), electrolytes, and other blood constituents. Compression to 31 ATA resulted in a twofold increase in urine flow accompanied by increases in excretion of osmotic substances (+40%) and sodium (+54%), and a reduction in urine osmolality (-32%). The increase in urine volume was greater (P less than 0.05) at night than day with no change in GFR between day and night, confirming the earlier findings. However, no change in plasma ANF was observed in spite of a sustained increase in daily sodium and water excretion at high pressure. These results suggest that the hyperbaric diuresis-natriuresis may not be directly mediated by the ANF release.

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