POLYURIA IN PAROXYSMAL TACHYCARDIA AND PAROXYSMAL ATRIAL FLUTTER AND FIBRILLATION

BY

PAUL WOOD

A footnote to this paper has become necessary. Wood (1963) wrote "Certainly the left atrial pressure rises appreciably in paroxysmal tachycardia, as my friend Dr. Saunders first showed me." I added that some notes with his paper about the regulation of aldosterone secretion and about suggestions for further observations that might be made during the polyuria were in the handwriting of Dr. D. E. Saunders. I did not know that Fig. 4, 5, and 6 of Wood's paper were taken from slides that Dr. Saunders had given Dr. Wood for his files, and that later these had been published as Fig. 1, 2, and 3 by Saunders and Ord (1962).

Dr. Saunders has kindly written to tell me that before he came to the National Heart Hospital in 1960-61, as Honorary Assistant Registrar, and had the privilege of helping Dr. Wood in his search for the explanation of this polyuria in paroxysmal tachycardia, he and Dr. John W. Ord had studied "The hæmodynamic effects of paroxysmal supraventricular tachycardia in patients with the Wolff-Parkinson-White syndrome"; and that this work had subsequently been published (Saunders and Ord, 1962).

Dr. Saunders added that they were happy to have their observations used in the context of Dr. Wood's paper; and I should like to thank them warmly, and their publishers, for their courtesy in approving the use that was made of their slides, inadvertently without their permission.

My object was to report the stage that Wood had reached in his work on the polyuria of paroxysmal tachycardia, and not to discuss in detail the many explanations that might be responsible for it. Had I been familiar with it, I should, however, have wished to refer to the work of Professor J. G. G. Borst of Amsterdam and his colleagues (Borst, 1948; Borst *et al.*, 1952) because they were familiar with this copious polyuria, and thought that paroxysms of tachycardia provided a good opportunity to study the effects of a rapid heart rate.

Borst (1954) wrote "If the heart rate does not exceed 170 a minute and the heart is otherwise normal, these attacks (paroxysms of tachycardia) give little discomfort to the patient. They are *nearly always accompanied by a copious diuresis* which cannot be distinguished from that following the injection of a large amount of saline. The loss of fluid may be so excessive that dehydration develops in a few hours. In some cases we found a fall in venous pressure and a shortening of the circulation time, indicating an excessive cardiac output".

"Fig. 12 presents the findings during an attack . . . and shows that the diuresis affects only the extracellular fluid. Potassium and creatinine excretion are almost constant. The initial water diuresis, which may be very pronounced, is lacking in this case. The sodium output gradually decreases in the four hours following the restoration of a normal heart rate, showing that the effect continues after the circulation has returned to normal." (Borst, 1954).

"If the heart is severely damaged, paroxysmal tachycardia is usually accompanied by oliguria and a rise in venous pressure. Under varying conditions of the heart in the same patient, an attack may be followed either by diuresis or oliguria." (Borst *et al.*, 1960). In a personal communication Borst writes "The observation that paroxysms of tachycardia accompanied by a fall in central venous pressure and by a rise in arterial pressure, always induced a diuresis similar to the renal response

following digitalis injection in patients with heart failure led us to the conclusion that Henry and Gauer's experiments could not explain the water and sodium retention in circulatory disturbances". I found no reference to this work in Wood's folder, but cannot say if, when he had finished, he would have retained the view that the polyuria was caused in the same way as that in Henry and Gauer's experiments. I emphasized that he had wished to make more observations before publishing his views but this was not possible, but it seemed right that his important observations should be recorded whether the explanation was correct or not.

MAURICE CAMPBELL

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