Incidence of Cardiac Arrhythmias in Chronic Renal Failure, Especially during Hemodialysis

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Dear Sir,

With great interest we read the article by Kimura et al. [1] discussing the incidence and causative factors of cardiac arrhythmias in patients on maintenance hemodialysis. A number of studies to define the same have been published previously [2–5]. We have conducted a similar study and would like to present our findings so as to compare our observations with the study quoted above.

Holter monitoring was done in 25 patients with chronic renal failure over a period of 24 h beginning the night before dialysis. Monitoring was extended till 4 h after dialysis. The incidence of ventricular and supraventricular arrhythmias analysed by sub-grouping into frequent, sporadic, and non-arrhythmia groups (as taken by the previous investigators) is compared in figure 1.

Contrary to the observations of Kimura et al., both ventricular and supraventricular arrhythmias were infrequent in our cases, nor did hemodialysis precipitate arrhythmias in these cases. The only patient with frequent ventricular premature depolarizations (VPDs) had precipitation during dialysis, and of the 3 with supraventricular premature depolarizations (SVPDs), only 1 had more frequent SVPDs during dialysis. In fact, the patient with frequent ventricular arrhythmias had been known as having ischaemic heart disease and had undergone coronary bypass 5 years ago. Our observations suggest that arrhythmias may not be a causative factor in dialysis-induced hypotension. In fact, arrhythmias were not observed in any of the 5 episodes of hypotension during hemodialysis.

Another interesting observation in our study was the occurrence of marked sinus tachycardia late during dialysis (3rd and 4th h) which persisted till 4 h after dialysis. This sinus tachycardia, as shown in figure 2, correlated

100
90 80 70 60 50 40 30 20–10 0

1 VPDs, Kimura et al. 2 VPDs, present study 3 SVPDs, Kimura et al. 4 SVPDs, present study

59
40
28
Fig. 1. Comparison of incidences of VPDs and SVPDs in the present series and in the cases of Kimura et al. (-) = No arrhythmia group; (+) = sporadic group (< 700 beats/day); (++) = frequent group (> 700 beats/day).

Fig. 2. Changes in heart rate (●) and blood pressure (○) before, during, and after hemodialysis.

Cardiac Arrhythmias in Chronic Renal Failure

with hypotension which was observed in 5 of these 25 cases. Of the known causes of dialysis-induced hypotension, none was more frequent amongst them. Most episodes of silent myocardial ischaemia were observed during this period of sinus tachycardia, occurring in 10 of the 25 cases.


References


MacDonald JL, Updall R, Buda AJ: The effect of hemodialysis
on cardiac rhythm and performance. Clin Nephrol 1981; 16: