Sterilization of Dialysate by Ozone

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Pyrogen reactions complicating haemodialysis are troublesome. The main origin of microorganisms is known to be the dialysing solution (Kidd, 1964; Sherris et al, 1961; Biagini et al, 1970; Jones et al, 1970). This problem is most frequent when a tank system is used on a 24-hour basis (two 11-hour haemodialyses). The consequences include uncomfortable haemodialysis vomiting, high temperature and shivering; it is also necessary to change the dialysate tubing constantly.

We have attempted to solve this problem by means of sterilizing the dialysate with ozone. The method is simple and cheap, and requires a generator of ozone and an air-compressor with which we bubble ozone into the tank (Figure 1). An hour of continuous bubbling of ozone into the dialysate guarantees total sterilization of the dialysate in the tank (Figure 2). It does not alter the acid-base equilibrium, phosphorus-calcium metabolism or haematocrit in the patient. On the contrary, pyrogen reactions disappear and haemodialysis is much more comfortable for the patient.

Figure 1. Diagram showing sterilization of dialysate by ozone
Figure 2. Tank contaminated on purpose with Escherichia coli

This system has been used in 568 dialyses; pyrogen reaction occurred in 2%, while in the same number of dialyses without ozone there was a 19% pyrogen reaction.

CONCLUSIONS

1. The use of ozone guarantees complete sterilization of the tank system within an hour.
2. Ozone greatly reduces pyrogen reactions during haemodialysis.
3. Ozone does not alter in any way the electrolyte composition of the dialysate or the patient's measurements in haemodialysis.

REFERENCES

Kidd, E. E. (1964) British Medical Journal, 1, 880