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The major transmissible spongiform encephalopathies (TSEs) of humans include Creutzfeldt–Jakob disease (CJD), kuru, fatal familial insomnia, Gerstmann–Strussler–Scheinker syndrome, and, within the past 10 years, variant CJD (vCJD). The pathology of these neurodegenerative diseases of the central nervous system is associated with the presence of pathologic prions, an abnormal conformation of a normal cellular protein [1].

Prions have been shown to be highly resistant to sterilisation procedures. Bernoulli et al in 1977 described a cerebral depth electrode that was used in a patient who subsequently developed CJD [2].;

Following sterilisation in benzene and alcohol, the elec-trode was used on two further patients who also later developed CJD. The same electrode was again sterilised and implanted into the brain of a chimpanzee which later developed a spongiform encephalopathy.

More recently, Zobelcy et al confirmed by mouse models that steel instruments can retain CJD infectivity even after formaldehyde treatment [3]. Infectivity of prions persists even after autoclaving at conventional temperatures and time periods (121 C for 15 minutes) and

demonstrates extreme resis-tance to high doses of ionising and UV radiation [4].

The ability of preparations of enzymatic medical instrument cleaners to reduce the infectivity associated with a rodent-adapted strain of human prion disease, previously reported to be resistant to decontamination, was tested. Efficient degradation of the disease-associated prion protein by enzymatic cleaning preparations required high treatment temperatures (50-60 degrees C).

Standard decontamination methods (1 M NaOH for 1 h or autoclaving at 134 degrees C for 18 min) reduced infectivity associated with the human-derived prion strain by less than 3 log10 LD50. In contrast, a 30 min treatment with the optimized enzymatic cleaning preparation protocols reduced infectivity by more than 3 log10 LD50 and when used in conjunction with autoclave cycles eliminated detectable levels of infectivity. The development of prion decontamination procedures that are compatible with routine cleaning and sterilization of medical and surgical instruments may reduce the risk of the transmission of prion disease in general surgery[3].

References

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