EVALUATION OF A NEW DISINFECTANT-CLEANSER DEVELOPED FOR USE IN FIBREOPTIC ENDOSCOPY

P. Gilbert, M.M. Al-Hiti, P.M. Smith, Department of Pharmacy, University of Manchester, Manchester M13 9PL.

There have been many reports pertaining to the microbiological hazards of endoscopy. These exist either as cross-infection between patients or their inoculation with organisms which have proliferated in the equipment during storage. A recent survey (Axon et al 1981) indicated that upto 45% of U.K. endoscopy centres were not utilizing effective disinfectant policies for endoscopes. Most centres had used glutaraldehyde at some time, but many had discarded its use due to staff sensitization. We have examined the antimicrobial activity of a new disinfectant/cleanser formulation (DTX) developed for use with contaminated fibreoptic endoscopes (Dettox ABC, Reckitt & Colman Ltd., Hull).

Minimum growth inhibitory concentrations (MIC) were determined using serial dilutions in nutrient broth and incubation for 3d. at 37°C. Minimum lethal concentrations (MLC) were determined in hard water (250 ppm $CaCO_3$) at 22°C using an endpoint method, and lecithin/tween broth as a growth and inactivation medium. MLC's were taken as that DTX concentration which reduced the microbial count from 10^7 ml^{-1} to below detectable limits within 5 but not 2.5 min . Sixteen strains of microorganism were tested, these included eight designated strains, *Pseudomonas aeruginosa* ATCC 9027 and NCTC 6750 M7, *Escherichia coli*, ATCC 8739; *Candida albicans*, ATCC 10231; *Staphylococcus aureus*, ATCC 6538; *Saccharomyces cerevisiae* , ATCC 287; *Klebsiella aerogenes*, ATCC 4352 and *Proteus mirabilis* RBH together with eight clinical isolates obtained from contaminated endoscopes at the Hull Royal Infirmary. All strains possessed MIC's (0.0005-0.1%^{v}/v) and MLC's (0.16-0.5%^{v}/v) which were considerably below that recommended for use (4.0%^{v}/v). Time-survival data was determined at 22°C for various DTX concentrations (0.1→0.4%^{v}/v) in hard water against *P. aeruginosa* ATCC 9027, and the effects of varying inoculum size, and the presence of varying concentrations of blood (0.1-2.0%^{v}/v), yeast cells (0.01-2.0%^{w}/v), serum (1-5%^{v}/v) and porcine mucin (0.05-0.4%^{w}/v) evaluated, 0.1%^{w}/v porcine mucin, 0.1%^{w}/v yeast cells, 0.5%^{v}/v blood and 5.0%^{v}/v horse serum completely inactivated 0.14%^{v}/v DTX under these conditions, and were therefore included in a multiple challenge of DTX at in use concentration. Twenty consecutive challenges with $5x10^6$ organisms ml^{-1} of *P. aeruginosa* inoculation. No viable cells were detected during these multiple challenges of 4.0%^{v}/v DTX. The activity of DTX (4.0, 2.0 & 1.0%^{v}/v) was also assessed against *S. aureus* ATCC 6531 cells dried upon glass slides in blood and mucin, and survival monitored at 2½, 5.0 & 10 min intervals. 4.0%^{v}/v DTX was effective at 2½ min in all circumstances, whilst 2.0%^{v}/v DTX required 5.0 min contact for effective sanitization.

The levels of organic debris used in these studies were considerably greater than those expected in practice with endoscopes (McClelland 1971). The data therefore suggest that DTX has the necessary range and degree of activity to effectively sanitize endoscopes from those organisms typically associated with cross-infection, even under these extremes of testing environment.

Axon, A.T.R. et al (1981) Lancet 1: 1093-1095

McClelland, (1977) Br. med. J. 1: 23-24

0022-3573/81/120070P-01$02.50/0