MICROBIAL ANTI-ADHERENCE PROPERTIES OF TAUROLIDINE

D.S. Jones, S.P. Gorman, D.F. McCafferty, A.D. Woolfson, Department of Pharmacy, The Queen's University of Belfast, Belfast BT9 7BL. (U.K.).

Taurolidine is a new broad spectrum, non-antibiotic antimicrobial agent derived chemically from the aminosulphonic acid, taurine. Taurolidine, a formaldehyde condensate, is stated to establish a stable equilibrium in solution (Myers et al. (1980). The compound has been shown to be effective in the prevention of Gram-negative infections and endotoxic shock and is intended to be used locally, particularly intraperitoneally, and in the bladder.

Adhesion of microorganisms to the mucosal epithelia is recognised as being an important step in the early stages of many infections. A number of studies on the anti-adherence effects of sub-inhibitory concentrations of antibiotics have demonstrated significant reductions in adherence (Shibl, 1985). An appreciable anti-adherence activity has recently been shown in the formaldehyde condensate, noxythiolin (Gorman et al. 1986). Taurolidine was therefore investigated for evidence of similar anti-adherence activity.

Buccal or uroepithelial cells (approximately 10^5 cells/ml in PBS) were collected and pooled from healthy volunteers and incubated for two hours at 37°C with the microorganisms (10^7 cells/ml). Taurolidine pre-treatments of the microorganisms were for time periods ranging from 5-240 mins. Taurolidine concentrations in the range 0.005-2.0% were examined. The number of adherent organisms per epithelial cell (minimum cell count 150) was compared to a control and statistically evaluated using an unpaired t test. Additionally the anti-adherence capacity of Taurolidine was investigated using a radio-isotopic assay employing ^{3}H leucine as the radiolabel (Calderone et al. 1984).

	Mean Number of Adherent Organisms per epithelial cell					
	C. albicans		*E. coli*		*S. saprophyticus*	
Taurolidine (2.0%)	2.30±0.29	$p<0.01$	14.29±2.18	$p<0.05$	24.28±3.20	$p<0.05$
Water	5.66±0.73		22.14±3.35		33.86±2.69	
Taurolidine (0.05%)	4.14±0.61	$p<0.20$	22.34±2.62	$p>0.5$	31.81±4.31	$p>0.5$

Taurolidine, generally recommended for use at a 2.0% concentration, was shown to significantly reduce the adherence of both exponential and stationary phase phase *Candida albicans* (vaginal isolate) to epithelial cells at concentrations greater than 0.1%. It was also shown that this anti-adherence capacity reached its optimum after an organism treatment time of 15 mins with Taurolidine in the range 0.5-2.0%. Treatment for a period of 5 mins with these concentrations showed no significant reductions in the number of adherent *Candida*/cell. Similar results were obtained using urine isolates of *Escherichia coli* and *Staphylococcus saprophyticus*. Additionally, pretreatment of the epithelial cells only (buccal or uroepithelial) with Taurolidine produced similar significant reductions in both *Candida* and bacterial adhesion.

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