

Disinfection Agents

Pages with reference to book, From 27 To 28

Fatema Jawad (Sughrabai Millwalla Hospital, Karachi.)

Disinfection in the operating and delivery rooms, applied with rigid discipline, has achieved much success with the development of new techniques and highly effective antimicrobial agents.

The most common antiseptic agents fall into four groups. Hexachlorophene is a chlorinated bisphenol compound. It is a strong bacteriostatic agent being very effective against Gram positive bacteria. It has little action on Gram negative organisms and spores. This brings about an easy contamination of soaps and creams containing hexachlorophene with *Klebsella*, *Pseudomonas aeruginosa*, *E. coli* and *Candida albicans* (Alyiffe et. al. 1969, Brunn and Degrones, 1971, Simmons 1969).

Compounds of iodine or iodophors are of two types. Poloxameriodine, a complex of iodine and Pluronic 188 and Povidone-iodine, a combination of iodine and polyvinylpyrrolidone. Both have a wide range of anti-microbial actions. Contamination of products containing these compounds has not been reported. Bacterial cultures from hands and operation sites scrubbed with iodophors yielded lower counts when compared with hexachlorophene (Crowder et. al. 1967).

Chlorhexidine gluconate is very effective against both Gram positive and negative bacteria and fungi at a pH between 5 and 8. It is available as a 4 percent detergent for scrubbing hands and skin cleansing where it is quicker acting than hexachlorophene and iodophors (Lowbury and Lilly, 1974). It is well tolerated (Maki, et. al., 1979), and contamination has not been reported (Rosenberg and Alatar, 1976).

Benzalkonium chloride, an organic ammonium compound, acts against both Gram positive and negative organisms along with some fungi and protozoa, It has been found to be very effective for penile urethral skin disinfection prior to catheterization and for the care of the indwelling catheter (Desautels et. al. 1969). Contamination of this product with *Pseudomonas* and *Enterobacter* has been reported. (Dixon et. al., 1976 Frank and Schaffner, 1976, Kaslow et. al., 1976, Plotkin and Austrian, 1958).

Toxicity studies have revealed the development of a vacuolar encephalopathy in premature infants bathed in a 3 percent hexachlorophene solution (Kundsin and Walter, 1973). Repeated use of detergents containing hexachlorophene for washing hands by pregnant nurses brought about an increased incidence of malformations in their newborns. (Check, 1978, Halling, 1978). But as yet the teratogenic activity is not fully established. (Ganerick, 1979). Severe metabolic acidosis has been observed in burn cases treated with povidone iodine (Lavelle, et al., 1975, Reitsch and Meakins, 1976). Absorption from the peritoneal cavity when used for irrigation in laparotomies can give significantly raised serum iodine levels.

Benzalkonium Chloride is a relatively safe germicide when used in solutions of 0.1 to 0.5 percent for topical application. Contact dermatitis has been reported. Strong solutions of 10 to 15 percent when inhaled can corrode the mucous membrane of the gastro-intestinal tract and pulmonary tree.

Chlorhexidine gluconate given orally produces hepatocellular and renal damage. (Chow et al. 1977). But dermal exposure does not have this danger as the absorption through the intact human skin is of a very small degree, if at all. (Case et al., 1976). Contact sensitivity has been observed to be minimal. (Rosenberg and Alatar, 1976).

These four relatively safe and effective antiseptics and disinfectants are utilised in most of the hospitals for preoperative skin preparation, as a hand disinfectant, in the management of wounds and burns as an obstetric cream, for bladder irrigation and for oral hygiene. But still it could be said, with the toxicity, side effects and sensitivity reactions in view, that the ideal agent is yet to be found.

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