

Disinfection and the Control of Nosocomial Infection

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Nosocomial or hospital acquired infections have become a major cause of morbidity and mortality today. The reported rates of nosocomial infection vary depending on the efficiency of the surveillance system and the definitions of infection employed. In the United States it has been estimated that about 5% of hospitalised patients acquire a nosocomial infection. This works out to be nearly 2 million infections per year¹. In Malaysia the true rate of nosocomial infection is unknown. A recent Ministry of Health survey gave an overall incidence of 1.3% but this is likely to be an underestimation². Incidence rates are often difficult to establish since it requires the close and continuous cooperation of ward clinicians and nurses. Nosocomial infections may also only manifest after the patient is discharged and such nosocomial infections are often not recorded. The cost of nosocomial infection is correspondingly high. The average cost of a nosocomial infection in the United States is more than a thousand dollars thus the total annual expenditure related to the management of nosocomial infection could exceed 2 billion dollars³. In the United Kingdom nosocomial infection was estimated to have cost 115 million pounds in 1987⁴.

Disinfection practices play a major role in the control of hospital infection. Lister who was Professor of Surgery in the University of Glasgow has been credited with the discovery of antiseptics. In 1867 Lister published his observations on the use of carbolic acid as a disinfectant for surgery. Today, a whole variety of compounds with different properties, antimicrobial spectra and potencies are available for use in medical practice.

For disinfection to be effective, disinfectants have to be used appropriately. The correct disinfectant has to be selected for the right purpose in much the same way an antibiotic is selected. Disinfectants have to be used at the correct dilution and the manufacturer's recommendations have to be rigorously adhered to. Objects or surfaces to be disinfected have to be thoroughly cleaned prior to disinfection as organic material can inactivate disinfectants. As a quality assurance measure, in-use tests of disinfectants have to be conducted regularly to ensure their efficacy under actual use conditions.

Disinfectants when properly used are a powerful tool against sepsis; when used inappropriately it can be a costly affair not only because disinfectants are expensive but the cost of managing preventable sepsis is also high. For these reasons the Ministry of Health has in 1979 published a disinfection policy for its hospitals. These guidelines have also been regularly updated.

In this issue of the journal Keah *et al* describe their experiences with bacterial contamination of disinfectants in some Malaysian hospitals⁵. Their results give rise to concern. Up to 16% of fresh disinfectants obtained from pharmacy and ward stocks were found to be contaminated with bacteria. This is alarming since these disinfectants were freshly prepared prior to actual use. It is ironic that the agents meant for preventing infection are themselves the vehicles for the spread of infections. Not surprisingly there was a correspondingly high failure rate in the "in-use" tests. A range of unused disinfectants including alcohol, chlorhexidine and phenolics were contaminated with

bacteria including *Pseudomonas aeruginosa*, *Acinetobacter* and *Flavobacterium*. These are common nosocomial pathogens. Similarly a wide range of disinfectants failed the "in-use" tests. These included solutions of glutaraldehyde, amphyl and chlorhexidine. Chlorhexidine 1 : 5000 for instance had a failure rate of as high as 81%.

These results emphasises the importance of the close monitoring of the preparation, storage and use of disinfectants. The Ministry policy on disinfection must be closely adhered to. It is not uncommon to find expensive disinfectants being used to clean floors where detergents would suffice. The pharmacy must ensure that disinfectant containers are thoroughly cleaned, washed and dried. There should never be any refilling

of disinfectant containers. Senior ward staff should ensure that disinfectants are correctly diluted and that a knowledgeable person should be performing this important task. Such procedures should not be left to the cleaners alone. The microbiology department should together with the control of hospital infection team routinely carry out "in-use" tests and take remedial measures where necessary.

Doctors all too often pay very little heed to matters like disinfection, considering such to be too trivial and mundane to warrant their attention. However such trivial measures which include hand-washing are those which have the most impact on the control of nosocomial infection.

References

1. Nosocomial infection surveillance, 1984. MMWR CDC Surveill Summ 1986;35 (No 1s) : 17ss.
2. Ministry of Health of Malaysia. Report of Health System Research on Nosocomial Infection Control (1990-1992). Project 1 : Nosocomial Infection Survey and Surveillance.
3. Haley RW, Schaberg DR, Von Allmen SD, Mc Gowan JE Jr. Estimating the extra charges and prolongation of hospitalisation due to nosocomial infections : a comparison of methods. J Infect Dis 1980;141 : 248.
4. Currie E, Maynard A. The economics of hospital acquired infections. Discussion paper 65, York : University of York. 1989.
5. Keah KC, Jegathesan M, Tan SC *et al*. Bacterial contamination of hospital disinfectants. Med J Malaysia 1995;50 : 291-7.