

**THE EVALUATION OF THE ANTIMICROBIAL
ACTIVITY OF DISINFECTANTS AND ANTISEPTICS
CURRENTLY USED IN AIN SHAMS UNIVERSITY
HOSPITALS**

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بسم الله الرحمن الرحيم



DEDICATED TO
MY HUSBAND HASSAN,
MY DAUGHTER NORAN
&
MY SON OMAR.

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INTRODUCTION
AND
AIM OF THE WORK

INTRODUCTION

Disinfection is the selective elimination of certain undesirable micro-organisms in order to prevent their transmission, and is achieved by action on their structure or metabolism, irrespective of their functional state (*Reber et al., 1972*).

A chemical substance or preparation is regarded as disinfectant only if it is active against vegetative bacteria, this is the first and main requirement. Therefore, disinfectant testing always starts with the determination of antibacterial activity (*Russell et al., 1983*).

Gram-negative bacteria, especially *E.coli*, *Klebsiella* spp., *Proteus* spp., and *Pseudomonas aeruginosa* appear to be increasingly implicated as hospital pathogens. They are often less sensitive than Gram - positive bacteria to various antibacterial compounds (*Baird-Parker and Holbrook, 1971*).

Pseudomonas aeruginosa, in particular, has long been considered as being an extremely troublesome organism with resistance to many antibiotics and other antibacterial agents (*Brown, 1975*).

However, the resistance of acid-fast bacteria to disinfectants is considered as being intermediate between vegetative bacteria and bacterial spores (*Spaulding et al., 1977*).

The advantages and limitations of the various disinfectants must be well known and appreciated. The disinfectant chosen must not be expensive, must not cause great inconvenience, should be adapted to the limitations of the home, office or hospital and should not cause offensive odors or disgusting nuisances. It must be safe for children and should not disturb the action of sewage systems (*Russell et al, 1983*).

the disinfectants are irritant and toxic to the tissues of the body and are suitable for disinfection of inanimate surfaces, however, the antiseptics can be applied to the body surfaces or to the exposed tissues safely without any harmful effects (*Lowbury et al., 1974*).

AIM OF THE WORK

Evaluation of the antimicrobial activity of various disinfectants and antiseptics used in Ain Shams University Hospitals and comparing them as regard advantages and limitations in order to choose the best ones for practical use and to avoid the unnecessary and incorrect use of them.

REVIEW
OF
LITERATURE

HISTORICAL ASPECTS OF CHEMICAL DISINFECTANTS AND ANTISEPTICS

In 1700s, a number of chemicals were being used as wood preservatives, wood tar had been used to preserve the timbers of ships and mercuric chloride was used for the same purpose in 1705. Copper sulphate was introduced in 1767 and zinc chloride in 1815. Many of these products are still in use today.

In 1827, a preparation of bleaching powder was employed by **Alcock** as a deodorant and disinfectant. **Davies** had suggested iodine as a wound dressing in 1839 and **Lefevre** introduced chlorine water in 1843.

Semmelweis in 1845 had used chlorine water also in his work on childbed fever occurring in the obstetrics division of the Vienna General Hospital. He achieved a sensational reduction in the incidence of the infection by insisting that all attending the birth washed their hands in chlorine water, later in 1847, he substituted chlorinated lime (**Selwyn, 1979**).

In 1850 **Le Beuf**, a French pharmacist, prepared an extract of coal tar by using the natural saponin of quillaia bark as a dispersing agent. Le Beuf asked a well-known surgeon, **Jules Lemair**, to evaluate his product. It proved to be highly efficacious. **Kuchenmeister** was to use pure phenol in solution as a wound dressing in 1860 and **Joseph Lister** also used phenol in his great studies on antiseptic surgery during the 1860s (**Hugo, 1978b**).

As regard the evaluation, **Bucholtz (1875)** determined what is called today the minimum inhibitory concentration of phenol, creosote and benzoic and salicylic acids to inhibit the growth of bacteria. **Robert Koch** made measurements of the inhibitory power of mercuric chloride, corrosive sublimate, against anthrax spores but overvalued the product as he failed to neutralize it (**Hugo, 1978a**).

This was pointed out by **Geppert who, in 1889**, used ammonium sulphide as a neutralizing agent for mercuric chloride and obtained much more realistic value for the antimicrobial powers of mercuric chloride which had been used as a wound dressing by Arab Physicians since the Middle Ages (**Selwyn, 1979**).