Barrier methods in the operating room: surgical habits die hard

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Transmission of viral infection, such as human immunodeficiency virus or hepatitis B and C, is a concern for both surgeon and patient. Published guidelines advise the regular use of barrier preventive measures in order to minimise the occupational exposure of surgeons.

A telephone survey was conducted of 92 orthopaedic, cardiothoracic and general surgeons in the South West Region of England, regarding their use of barrier methods.

This survey shows that only a minority of surgeons regularly use protective measures, although they are readily available.

Blood-borne infections are an increasing concern for both surgeon and patient. Viruses can be transmitted through skin lacerations and through contact with mucous membranes, such as the conjunctivae (1–4). Transmission via the latter, arising particularly from oral or nasal mucosae, may go unrecognised (5).

Seroconversion of exposed health care workers varies considerably, from 0.4% with human immunodeficiency virus (HIV) to 30% for hepatitis B viruses (HBV) (5).

The Centres for Disease Control have proposed universal precautions for the protection of surgical staff, as every patient should be treated as potentially infected ('high risk'). The wearing of protective gowns, masks, eye visors and double gloves is advised (4). Similar guidelines have been recommended by the Expert Advisory Group on Acquired Immunodeficiency Syndrome (AIDS) in 1990 (6) and the British Orthopaedic Association in 1991 (7). The latter has pointed out that cotton gowns are no longer acceptable and should be replaced by high quality waterproof fabrics. The subcommittee of the Association of Operating Room Nurses has suggested that surgical gowns be made of a material that is resistant to penetration by blood and other fluids and that barrier quality be maintained through multiple lauderings (8).

Ordinary spectacles do not provide adequate protection either. Goggles or visors should be used instead (7).

The aim of our study was to determine the attitude of the surgeons towards barrier precautions and how their practice may be modified.

Methodology

Eleven hospitals in the South West region of England were contacted by telephone. Six hospitals were using two types of gowns, cotton and waterproof. Four hospitals were using waterproof gowns exclusively, while one was using only cotton gowns. These five hospitals were excluded from further study, as the surgeons were not presented with a choice over the type of gowns they could use.

In all, 94 doctors, consultants and trainee surgeons in orthopaedic, cardiothoracic and general surgery, were contacted. They were questioned about their use of gowns, eye protection, double gloving and masks. Their specialty and grade was also noted (Fig. 1).

Results

Of the 94 surgeons contacted, 92 responded. There were 53 orthopaedic surgeons (100% response), 24 general surgeons (90%) and 15 cardiothoracic surgeons (100%).

The fluid-resistant gowns were used routinely by 19 of
the surgeons (19%), while another 70 (78%) used them only if offered, not otherwise demanding them (Table I). Only three surgeons never used them, one attributing this to his large size.

Thirty-four surgeons (36%) always wore some form of eye protection, while 44 (47%) wore them when dealing with 'high risk' patients. Fourteen surgeons (14%) never used them because of inconvenience or discomfort from steaming (Table I).

There were 23 surgeons (25%) who always used a double gloving technique. Forty-five (50%) used them occasionally, mainly when dealing with 'high risk' patients. Twenty-four surgeons (25%) never double gloved. The reason offered was impaired tactile sensation. With the exception of three, all surgeons routinely used masks (Table I).

By grade, 30% of consultants and 20% of career trainees used the waterproof gowns regularly (Table II); this was more often than junior doctors (12%). A higher proportion of consultants (54%) and SHOs (70%) were employing eye protective measures regularly, compared with the career trainees (20%). Double gloving was routine for almost one-quarter of all grades (Table II).

**Discussion**

Health care workers have an increased risk of exposure to blood-borne viruses, such as hepatitis B, C and HIV, especially when dealing with trauma patients. These viruses are no longer restricted to 'high risk' groups. New HIV infections reported in the last 12 months in the United Kingdom were acquired by heterosexual intercourse in 30% of the cases, homosexual 54% and intravenous drug abuse in 6% (9).

Surgeons are at an increased risk of acquiring infection through not only skin but also mucous membrane exposure (3). Orthopaedic surgeons are especially at risk because of the use of power tools (10). The potential for exposure is increased further by the fact that the carrier status of the patient is seldom known before surgery. The patient might not be aware that he is infected, or the surgery is performed before the HIV test results are available. Furthermore, studies have shown that high HIV risk status was not associated with a lower exposure rate (11).
Since there is no effective treatment for these viral diseases and vaccination is not available (except for hepatitis B), preventive measures are the only way of limiting the occupational spread of infection among health care workers. Thus, preventive measures should be considered seriously by the surgical staff and their institutions.

This study shows that only a minority of surgeons routinely protect themselves adequately, despite the availability of protective clothing. This finding correlates with surveys of other surgical departments (12-14). The various reasons proposed are: inconvenience; subjective loss of sensitivity and dexterity with double gloves (15) and the failure to request fluid repellent gowns routinely. The false sense of security by categorising patients to high risk groups is also a factor which prevents the adoption of routine protection.

Barrier measures are effective in limiting exposure to contaminated fluids (4). These measures should be more widely used, especially as the prevalence of patients infected with pathogens transmissible by body fluids is largely unknown. Abolishing the ordinary cotton gowns in favour of the fluid-resistant ones will facilitate the wider use of barrier methods by the surgeons.

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