

## CONTINUING MEDICAL EDUCATION

### PREVENTION OF HIV INFECTION

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HIV virus has been reported as positive in 2167 individuals out of 461118 tested in India(1) emphasizing the need for knowledge of preventive measures.

#### Modes of Infection

These are sexual contact (both heterosexual and homosexual), transplacental (from infected mother), transfusion of blood or blood products, use of improperly sterilized instruments by health personnel, or for ear piercing and tattooing, sharing of needles by drug abusers and any contact of raw tissues with infected blood or other body fluids.

The virus multiplies in the lymphocytes and macrophages, hence blood is the main source of infection. Pus, CSF and other body fluids contain small numbers of the virus. The virus is not transmitted by inhalation, ingestion or casual contact like

shaking hands, kissing, sharing of eating and cooking utensils.

#### Modes of Disinfection

*Heat sterilisation:* This is more reliable and the preferred method. It can be done by autoclaving or pressure cooking at 120°C and 2 atmosphere pressure for 20 minutes (for reusable instruments), boiling in water for 20 minutes or sterilising by dry heat in an electric oven (including a household oven) at 170°C for two hours.

*Chemical disinfectants:* Compounds which release chlorine are excellent disinfectants, beside being viricidal, easily available and inexpensive. However, they are inactivated by organic matter, like blood. They have to be used as fresh solutions of specific concentrations (*Table I*) for good results. To avoid metal corrosion, plastic containers are essential. Sodium hypochlorite is commonly used, but calcium hypochlorite (household bleaching powder) is a good and cheap substitute. Non chlorine liberating substances (*Table II*) can be more expensive.

#### Preventive Measures

The following measures have been adapted from the guidelines laid down by the Centre for AIDS Research and Control (CARC) of the Indian Council of Medical Research(2).

##### A. Handling of AIDS Patient or HIV Positive Patient with Symptoms

All such patients should be admitted in

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TABLE I—Chlorine Liberating Chemical Disinfectants

Chemical	Available chlorine (%)	Concentration for		Approximate price
		Lightly soiled equipment	Heavily soiled equipment	
1. Sodium hypochlorite salt or 4% solution	5 5	0.1% (1 g/L) 25 ml/L	1% (10 g/L) 250 ml/L	Rs. 46/- per 5 litres
2. Calcium hypochlorite (Bleaching power)	70	1.4 g/L	14.0 g/L	Rs. 12/- per kg
3. Sodium dichloroisocymirate (NaDCC)	60	1.7 g/L	17.0 g/L	—
4. Chloramine (tosyl chloramide sodium) 2%	25	20 g/L	80 g/L	—

TABLE II—Non Chlorine Liberating Disinfectants

Chemical	Concentrations		Approximate price
	Available (%)	Recommended	
1. Ethanol	70	70%	Rs. 180/- per litre
2. Polyvidone Iodine (PVI)	10	2.5% (1 : 3 dil)	Rs. 150/- per litre
3. Formaldehyde	35-40	3.5-4% (1 : 10 dil)	Rs. 255/- per 25 litres
4. Hydrogen peroxides	30	6% (fresh solution)	Rs. 42/- per litre
5. Gluteraldehyde	2	Use after activation with powder provided	—

a separate ward labelled 'Biohazard—No Admission', with restricted entry of health personnel. Wearing of fully covering aprons or gowns should be essential. Blood and other biologic fluids should be handled with gloved hands only, rinsing gloves in chemical disinfectant before removing and

soaking in the same for 20 minutes. Hands must be washed thoroughly with soap and water.

Use of sharp instruments and needles should be avoided. If used needles must not be recapped. The tip of disposable syringes must be burnt to prevent reuse, and

all used needles and syringes soaked in disinfectant in a plastic container for 20 minutes or disposed in an incinerator.

Review the need for invasive procedures like dialysis and surgery, weighing benefits against the risk of spread of infection. Use mechanical ventilatory support like Ambu bag if needed.

### B. *Special Precautions in the Laboratory*

These are include the following:

- (i) A 'Universal precaution approach', i.e., precautionary measures for all samples from all patients is best.
- (ii) Full-sleeved aprons, eye shields, masks and gloves must be worn while collecting and testing samples.
- (iii) Pipetting device must have cotton plugs; never pipette by mouth or blow from the pipette (to avoid squirting).
- (iv) All glassware and gloves should be discarded as mentioned above.
- (v) The work area must be cleared with disinfectant after every procedure and at the end of the day.

### C. *Situations Requiring Special Mention*

These include the following:

- (i) Spilt blood-1% sodium hypochlorite solution must be poured on and around the spill with gloved hands and wiped with absorbent cotton after 20 minutes. The procedure must be repeated once more, and the used cotton discarded by soaking in disinfectant.
- (ii) Blood soiled linen is soaked in water and detergent at 70°C for 25 minutes. Use of bleaching powder is highly recommended.

(iii) Blood soiled instruments should be washed with detergent, then soaked in 2% glutaraldehyde for 30 minutes before autoclaving.

(iv) Performing an autopsy: All personnel should wear plastic aprons, double gloves, masks, eyeshields and boots. Collected tissues should be put in 10% formaldehyde immediately.

After autopsy the body should be wrapped in a heavy duty plastic sheet as follows: Fold the head and foot end before the sides and secure with waterproof tape, then place the wrapped body in a tubular polythene bag and double seal it. Put identification card in a separate plastic bag outside. The body should be disposed off, preferably by cremation, without opening the seals.

(v) Fumigation and disinfectant fogging of patient area is not necessary. Cleaning with soap and water and mopping with disinfectant is adequate.

(vi) Routine waste, garbage and leftover food does not require special treatment.

### D. *Contact with Asymptomatic HIV Positive Individuals*

Day to day contact does not require special precautions. For cut, bruises or blood stained discharge from boils, precautions as mentioned under subhead 'A' are necessary. Soiled sanitary napkins should be soaked in chemical disinfectants for 20 minutes before discarding.

### E. *Health Care Worker*

Risk to health care workers is real with 22 (including one from India) reported to have been infected(3). A 'universal

precaution approach' is recommended while dealing with high risk patients and their tissue fluids to minimise the risk.

Active research is being carried out at many centres to find a cure or vaccine against this scourge of the 20th century. Till success is achieved, the only way of limiting its dissemination and spread is by following preventive methods rigidly.

### Acknowledgements

The authors wish to thank Dr. (Mrs) P.M. Pai, Dean, Seth G.S. Medical College and K.E.M. Hospital for allowing them to publish this article.

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## EMERGENCY TIPS

### J.S. Surpure

The enlarged, tender and discolored scrotum in children may present a major diagnostic dilemma. The correct diagnosis is essential to avoid irreversible testicular injury. Hermann(1) discusses a systematic approach to the evaluation and management of the acute red scrotum:

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(i) *Testicular torsion*: This is the one diagnosis that cannot be missed if gonadal preservation is to be a reality. Extravaginal torsion is found exclusively in neonates and presents at or shortly after birth. Intravaginal torsion involves twisting of the testes within the tunica vaginalis. This is called "bell-clapper" deformity due to the lack of posterior attachment of the testis to the scrotum, thus allowing for potential twists and subsequent vascular compromise. This type is more common in the prepubertal and postpubertal males. The patient presents with a history of pain with either acute or insidious onset that radiates to the groin. There may be nausea with or without vomiting and abdominal pain, but rarely fever. Physical examination reveals clearly unilateral edema and erythema of varying degrees in most patients. Prehn's sign (relief of pain on elevation) is not reliable enough in children to differentiate epididymitis from torsion. Testicular radio-nuclide scan is the most commonly used adjunctive test. Its use depends on availability to the clinician on a 24-hour basis and expertise in interpretation. The scan reveals diminished or absent blood flow to the hemiscrotum as opposed to increased or lack of decrease with epididymitis. The accuracy depends on the technique, cooperation of the patient and the stage of the pathologic process. Doppler ultrasound has been used in older patients. However, it is not used in younger patients due to inadequate cooperation and lack of sufficient expertise in certainty of the diagnosis.

(ii) *Epididymitis*: Like torsion, epididymitis may present with pain but is usually insidious in onset over several days. Unlike torsion, it is not usually associated with gastrointestinal symptoms. Urinary symptoms are not uncommon and urinalysis may reveal pyuria. The causes of epidi-