REVIEW ARTICLE

HIV AND ANAESTHESIA

Dr. S. Parthasarathy[1] Dr. M. Ravishankar[2]

SUMMARY

The pandemic of AIDS (Acquired Immuno Deficiency Syndrome) is virtually creating a panic among health workers which include and medical and paramedical staff. Out of the global 40 million Human immunodeficiency virus (HIV) infections, an estimated 5.2 millions are in India. With the advancement of the management techniques, the life span of infected patients is on the increase so that more patients will come for surgical procedures in the future. There is little information on the risk of anaesthesia in HIV infected patients. A detailed preoperative examination and investigations to unmask multisystem disorders caused either by HIV or drugs is essential. General anaesthesia is acceptable but drug interactions and multisystem disease caused by HIV should be considered preoperatively. Regional anaesthesia is safe but one must take into consideration the presence of local infections, bleeding problems and neuropathies. Routine preoperative testing for HIV is acceptable but strict adherence to universal precautions is mandatory.

Keywords : HIV, Anaesthesia.

Introduction

Since the first report of death due to Pneumocystis carini pneumonia [1] and identification of HIV (Human Immunodeficiency Virus) in 1981, the incidence of HIV infection has risen to alarming proportions. On a global basis, 40 million people are living with HIV with India accounting for 5.2 million.[2] The last decade has seen a tremendous advancement in the understanding and management of HIV disease resulting in longer life spans with increased chances of anaesthetic interventions. It is estimated that 20-25 % of HIV positive persons need surgery at some point of their lives.[3] Hence as anaesthesiologists, the knowledge of HIV and its implications becomes an absolute necessity.

Epidemiology and general considerations

HIV belongs to Lentivirus group of retroviruses. Two distinct variants, HIV 1 and 2 have been identified with HIV 2 predominantly found in Africa. Retroviruses contain the enzyme reverse transcriptase that allows viral RNA to be transcribed to DNA which is then incorporated to host cell genome. The virus preferentially infects T helper lymphocytes (CD4 T cells) and progressively destroys them. This leads to increased susceptibility to opportunistic infections and malignancies.[4] The modes of spread of HIV infection and the risk of acquisition with each act are tabled below.

1. M.D., D.A., D.N.B., Consultant anaesthesiologist
Govt. Dist. Headquarters hospital
Kumbakonam. 612002. Tamilnadu. India.
2. M.D., D.A., Prof. and Head
Dept. of anaesthesiology
Mahatma Gandhi Institute of Medical sciences and research
Pondicherry, India.
Correspond to :
Dr. S. Parthasarathy
20, Palanisamy Nagar, Chennai Road,
Kumbakonam - 612002. Tamilnadu. India.
E-mail : painfreepartha@yahoo.com
(Accepted for publication on 15-3-2007)

Table - 1 : showing the mode of spread of HIV.[5]

Mode	Percentage (%)
Sexual contact	60-70
Blood transfusion	3-5
Mother to child	20-30
Injecting drugs use	2-3
Needle stick	1

Table - 2 : showing the risk of acquisition with each act.[6]

Exposure route	Risk/10,000 exposures
Blood transfusion	9000
Child birth	2500
Needle sharing injection	67
Receptive anal intercourse #	50
Receptive penile vaginal intercourse #	10
Needle stick	30
Insertive anal intercourse #	6.5
Insertive penile vaginal intercourse #	5
Insertive oral intercourse #	0.5
Receptive oral intercourse #	1

= NO CONDOM USE

The clinical course of HIV infection[7] begins with a brief seroconversion illness; proceed to a chronic asymptomatic phase which varies from 2-10 years before they develop symptomatic AIDS (Acquired immunodefiency syndrome Fig 1.)

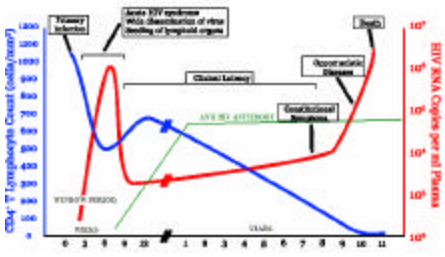

Fig 1. Showing the clinical and Lab. profile of HIV infection.[8]

Diagnosis is based on detection of anti HIV Ig G antibodies by ELISA or the western blot test. In acute phase of seroconversion (2-12 weeks) the tests may be negative but these patients are infective. This is called the window period when HIV RNA test and p 24 antigen assays are helpful.

Clinical features with anaesthetic importance

HIV disease is a complex medical disorder with widespread systemic involvement in effect to become a medical sub specialty. The neurological, pulmonary, cardiovascular and haematological abnormalities are of particular concern to anaesthesiologists.[9]

In the early stages of HIV infection, headache, photophobia, meningoencephalitis, depression, cranial and peripheral neuropathies have been documented. The late phase may be associated dementia, encephalopathy, myelopathy, myopathy and peripheral neuropathy. Even though meningitis is frequent with cryptococcal infection, tuberculous and syphilitic etiologies have been reported. The infectious nature of CSF in HIV must be considered. The incidence of peripheral neuropathy is 35 % in early HIV infections[10] which rose to 55% in late stages. Distal symmetric polyneuropathy, Inflammatory demyelinating disease, progressive polyradiculopathy have been reported.[11] HIV associated neoplasms can cause increased ICP and cerebral edema which deserves anaesthetic consideration. An autonomic dysfunction is also reported in HIV infections.[12] Gluct T et al[13] found an incidence of 15% of cardiac autonomic neuropathy in HIV infected persons. Pericardial effusion, myocarditis, endocarditis (in intravenous drug abusers) dilated cardiomyopathy (DCM) and pulmonary hypertension (PH) are reported.[14] There is an increased incidence of coronary artery disease in HIV infections. In a routine examination of Echo heart of HIV infected patients DCM was found in 30-40 %. The incidence of PH was 1/ 200 in HIV infections while it is 1/200,000 in general population. HAART (Highly active antiretroviral therapy) decreased the incidence of pericardial disease at the cost of increased coronary artery disease due to the dyslipidemia associated with some antiretroviral drugs.[15] Bacterial pneumonia with special reference to Pneumocystis carini, and tuberculosis may be present. Kaposi's sarcoma, lymphomas and nocardiosis may also affect the lungs.[16] Crans et al[17] suggested that a CT chest may show abnormalities in the presence of normal X-ray chest. Bone marrow involvement may lead on to pancytopenia. Coagulation problems may vary from a hypercoagulable state to a thrombocytopenic bleeding state. Callens et al[18] reported an increased frequency of venous thromboembolism in HIV infected persons. There should be a need for heightened awareness of coagulative disorders[19] in these patients. Eledrisi et al of adrenal insufficiency was[20] reported in three patients with HIV infection, but with a normal ACTH response test. A number of metabolic disorders like hyperglycemia, hypercholesterolemia and diabetes mellitus have been reported.[19]

Treatment

Treatment of HIV infection include the following

1. Antiretroviral drugs
2. Treatment of opportunistic infections.
3. Avoidance of alcohol and smoking.
4. Psychosocial counseling.
5. Nutritious diet.

Drugs and anaesthetic importance

HIV infected patients may be on drugs which include four types of antiretrovirals, antituberculous drugs, pentamidine and steroids. The side effects with relevance to anaesthesiologists of some commonly used drugs are tabled.[21,22,23]

Table - 3 : Showing drugs and side effects.

Drugs	Side effects.
Nucleoside analogues	
1. Zidovidine	Marrow supression,myopathy,Inhibits cytochrome p450.
2. Lamividine.	Well tolerated. Diarhoea, headache. Peripheral neuropathy
3. Stavudine	Peripheral neuropathy
4. Tenofovir	Renal toxicity
5. Didanosine	Diarhoea, peripheral neuropathy
Protease inhibitors	
1. Indinavir.	Nephrolithiasis, Inhibits cytochrome p450.
2. Saquinavir	Diarhoea,headache, Inhibits cytochrome p450.
3. Ritonavir	Inhibits cytochrome p450, elevated triglycerides
4. Atazanavir	Diarhoea,jaundice
Nonnucleosides	
1. Efavirenz	Dizziness,teratogenicity
2. Nevirapine	Rash, induces cytochrome p450.
Fusion inhibitors	
1. Enfuvirtide	Injection site reactions, headache ,bacterial pneumonia
Pentamidine	Bronchospasm, arrhythmias, electrolyte imbalance
Anti TB drugs	Hepatic renal dysfunction, thrombocytopenia.

Anaesthetic considerations

Patients with HIV infection can report for HIV related problems or unrelated problems like trauma. The common surgical interventions are opening of abscesses, Caesarean section, abdominal emergencies like bleeding and perforations, lymph node biopsy, splenectomy, colectomy, sepsis of the genital tract, perianal ulceration, fistulation or lymphomas, placement of venous lines and nasogastric tubes.[24,25]

A preoperative check up should include

Careful history to know the diseases like cardiomyopathy, pulmonary complications, peripheral neuropathy, drugs and bleeding episodes and the findings should be documented. Any other systemic involvement either due to HIV or drugs should be noted.

Investigations

1. Routine laboratory evaluation like total and differential count, Hb%, platelet count, clotting function evaluation, electrolytes, blood grouping and tests for renal and hepatic function should be done. Anemia with undue tachycardia is usually associated with HIV infections.[26]
2. Electrocardiogram, Echo heart.
3. Pulmonary function test and arterial blood gases. Around 2/3rd of HIV patients suffer from some respiratory illness during their disease and hence investigation to diagnose hidden lung disease assumes significance.[27]
4. X-Ray chest and CT chest if warranted.
5. MRI spine or brain if demyelination is suspected. Opportunistic cerebral infections like asperigellosis can be detected by MRI and CT findings may be nonspecific.[28]
6. Preoperative consent should be proper if there is dementia.[29]
7. CD 4 count (count>500 is better). Increased postoperative infective[30] complications were found in patients whose CD 4 count is less than 200/mm^3
8. IV access may be difficult in drug abusers.
9. Substance abuse and anaesthetic interactions should be borne in mind.

There is little specific information on overall risk of anaesthesia and surgery in HIV positive patient and no surgery should be deferred on the basis of HIV positivity alone.[31] ASA risk class is more important than HIV status in the possibility of perioperative complications. General anaesthesia is acceptable but drug interactions and multisystem disease caused by HIV should be considered preoperatively. Regional anaesthesia is safe but one must take into consideration the presence of local infections, bleeding problems and neuropathies.[32] Anaesthesia and surgery decrease cell mediated immunity and the effects are more pronounced after General than Regional anaesthesia.[33] Antiretroviral drugs affect cytochrome p 450. Etomidate, atracurium, remifentanyl and desflurane are independent of cytochrome p 450 and are preferred. The metabolism of midazolam and fentanyl are affected by cytochrome p 450 and are better avoided.[34] Succinyl choline should be used with caution in renal dysfunction and in the presence of myopathy. CMV (Cytomegalovirus) adrenalitis may affect intraoperative haemodynamics and some patients need steroid supplementation. HIV associated anaemia, fever, dehydration, hypoproteinemia tachycardia and electrolyte imbalance may compel us to make scientific use of anaesthetics and relaxants. Oropharyngeal and oesophageal pathology may make some patients prone for difficult intubation, regurgitation and aspiration. Subtle or overt lung pathology may need intraoperative increase in FiO2.The presence of neuropathy may necessitate careful positioning during anaesthesia.[35] A routine placement of PALL BB22-15MS filters[36] in Y circuit provided adequate protection against cross infections during anaesthesia. Tachycardia was more frequent during anaesthesia[37] while fever, anemia and tachycardia were more frequent in the postoperative period in HIV infected individuals. Watts D et al[38]opined an increase in the number of endometritis and wound infection in caesarean section (LSCS) patients with HIV infection. Major and minor postoperative complications were significantly more in HIV infected caesarean section patients.[39] There was an increased incidence of wound breakdown[40] after laparotomy in LSCS patients. Contrary to the above studies Avidan MS et al[41] concluded that elective caesarean section under spinal anaesthesia taking ART(antiretroviral therapy) was not associated with increased incidence of perioperative complications. Ayers J[42] and Smirnov GG[25] in their respective studies concluded that HIV per se does not increase post procedure complications and surgery should not be withheld on the basis of HIV status alone. SIADH caused by HIV should be kept in mind in the postoperative period and electrolyte monitoring should be done in selected cases. Perioperative continuation of ART is essential. The use of erythropoietin in selected cases and immunotherapy in the future may form important tools in the perioperative management.[43]

Obstetrics and HIV[35]

The risk of transmission from the HIV infected mother to child is around 25%. Zidovidine monotherapy has reduced

the incidence to 8% a combination of ART and elective caesarean section has reduced the transmission to 2%.[44] Hence as anaesthesiologists we may encounter a number of patients posted for elective caesarean section. There is little evidence to suggest that HIV increases complications of pregnancy or pregnancy alter the clinical profile of HIV infection.[45,46] Bremerich et al[47] suggested intrathecal mepivacaine with sufentanyl an appropriate anaesthetic option for LSCS.

The perinatal transmission[48] is as follows.

Table - 4 : Showing perinatal transmission.

Type of intervention	Percentage of transmission
No intervention	20%
Zidovidine monotherapy	17%
LSCS	8%
Zidovidine + LSCS	0%

In developing countries, with increased post caesarean section morbidity, mortality and resource crunch,[49] vaginal delivery with suitable precautions can be used in selected cases. In the postoperative period, narcotics and drug interactions should be kept in mind. The use of epidural blood patch (EBP) for postdural puncture headache is safe. EBP[50] is acceptable provided no other viral or bacterial infections are active. There was no increase in morbidity after EBP[51] for two years in HIV positive patients. The era of HAART (highly active antiretroviral therapy) has decreased the incidence of perinatal HIV transmission.[52]

HIV and pain

There are various causes of pain in HIV infection. Acetaminophen, Codeine, Morphine, Topical Capsaicin, Viscous xylocaine, Amitriptyline, Carbamazepine, Mexilitene and Prednisone have been used with variable success. The key points are

- Pain is a common and debilitating symptom of HIV disease; it is seriously under treated.
- The multicentre study shows that pain is present in 62% of HIV inpatients, that its severity decreases their quality of life, and that over half with significant pain do not receive any analgesic treatment.
- Under treatment of pain in HIV disease is related to doctors both underestimating pain and under prescribing analgesics.
- The more severe the pain, the more often doctors underestimate it.
- Doctors are reluctant to prescribe potent analgesics. Likelihood of analgesic prescription increases when doctors estimate pain to be more severe and regard patients as sicker.[53]

HIV and critical care[54]

Acute respiratory failure is the commonest cause of ICU admissions in HIV patients. Pneumocystis is identified as the responsible pathogen in 25-50% of cases. Pneumatoceles and pneumothorax may manifest. Trimethoprim – sulfamethaxozole or pentamidine IV are suggested effective therapies. Noninvasive ventilation techniques may be associated with less incidences of pneumothorax. Bacterial pneumonia with Pseudomonas and Staphylococcus may also cause acute respiratory failure for which routine guidelines for management of acute lung injury will apply. Intractable seizures with the cause being either a mass lesion or infection like Cryptococcus may present in the ICU. Gastrointestinal bleeding due to infectious ulceration or Kaposi s sarcoma may present with shock. This may be complicated by an associated thrombocytopenia. Bowel perforation, AIDS cholangiopathy and pancreatitis are the other causes of ICU admissions.[3] Life threatening situations and emergencies may present a situation to the anaesthesiologist in such a way that universal precautions may be forgotten.[55] In severe sepsis patients with HIV infections[56] patients were less likely to be admitted in ICU but with a greater mortality rates.

Safe blood

Anaesthesiologists use blood transfusion more commonly than any other faculty personnel universally. Paid donation and plasma trades are unrecognized forces that drive an AIDS epidemic in developing countries. Volkow et al[57] suggested to avoid paid donors and this route of transmission can be combated by a safe blood programme. A safe blood programme needs a safe donor. After a study of prevalence of markers of transfusion transmissible diseases, it was concluded that voluntary blood donor service with students[58] as major donors is the answer to counter this problem.

Risk of cross infection[59]

Inhospital transmission of HIV in anaesthetic practice may occur in three ways.

1. Patient to anaesthetist

HIV can be transmitted through sharp injuries, broken skin with body fluids and splashing of a mucosal surface. The risk of transmission by needle stick injury varies from 0.3 – 0.03%. Factors which increase transmission are

- Hollow needle injuries,
- Volume of inoculated blood
- Depth of injuries.

20 % of anaesthesiologists had at least a needle injury in a 3 month period. This implies a cumulative risk of 4.5% in a 30 year anaesthesia career. Poor infection control practices put anaesthesiologists at risk. 8% of anaesthesiologists wore gloves for peripheral venous cannulation and 90% for central venous cannulation. Its ideal that we should wear in 100% of cases. The following details with regard to contact of body fluids and blood are tabled.[60] (Table 5.)

Table - 5 : Showing the probability of blood contact.

Procedure	% of blood contact
Peripheral venous catheterization	18%
Central venous catheterization	87%
Arterial puncture	38%
Lumbar puncture	23%
Epidural catheter	34%
Endotracheal intubation	4%
Extubation	9%
Suction –oral cavity, trachea.	13%
Intramuscular injection	8%
Connection, discontinuation of drip- blood	43%

2. Patient to patient

Reuse of syringes, airway devices should be condemned. Either a disposable respiratory circuit or hydrophobic filter is warranted. Laryngoscopes should be properly sterilized before reuse.

3. Anaesthetist to patient

The risk appears low. It is estimated around 2.4-24 per million procedures. The adoption of universal precautions is mandatory to decrease the inhospital transmission. Blood contamination and contact was more in emergency ward than in operation room and was decreased by 98% on wearing gloves.[59] In a study of following universal precautions, 65% of Thai anaesthesia personnel don't follow universal precautions and at least one third admitted that they recap needles before disposal.[61] In a study of gloving practices[62] it was observed to be deficient in paediatric cases and in anaesthesiologists aged 55 or more. It was noted that anaesthesiologists[63] were aware of the precautions and hygienic practices but performance falls below expectations.

Universal precautions

Universal precautions as defined by CDC[64] (Centers for disease control and prevention) are a set of precautions designed to prevent transmission of HIV to health workers while providing health care. They apply to blood, body fluids containing blood, semen, vaginal secretions, tissues, CSF, pleural, peritoneal, pericardial and amniotic fluids. They do not apply to faeces, sputum, sweat, tears, urine and vomitus unless they contain blood.

1. Washing Hands - One of the most important requirements and the one that is most commonly ignored is washing hands, before and after seeing a patient. Strict adherence to washing hands with ordinary soap clearly reduces the risk of transmission of HIV and many other infectious agents.
2. Wearing Gloves - A pair of disposable plastic gloves have to be worn whenever the potential for a contact with the patient's body fluid exists. At surgery, where there is a risk of injury from sharp objects, double gloving with good quality latex gloves is recommended. Fortified gloves that reduce chances of injury from sharps are not universally available and are also expensive.
3. Eye Glasses/Cap/Mask - The eyes are to be protected from split secretions by wearing goggles; the conventional glasses worn for correction of eyesight defects are open in the sides; but nevertheless give acceptable protection. The cap and mask protect the head and face from being exposed to spillage.
4. Foot Wear - The feet are notorious for little cuts and abrasions that may be contaminated by body fluids. Gumboot types of footwear are to be worn to avoid this.
5. Impervious Gown - While disposable impervious gowns are available, the cost may not be justifiable. In our conditions, use of a plastic apron under the conventional operating gown will serve the purpose.
6. Needles and Sharps - Manipulation of needles like bending and re-sheathing should be avoided. The used needles are to be deposited in thick walled puncture resistant containers for later incineration. Thick cardboard boxes discarded in the pharmacy can be for this purpose. A small square hole is made in the top for deposition of the needles. It is sent for incineration when two thirds full.

7. Surgical technique - Risk from needle prick injuries are greatest when working in depths like pelvis, the diaphragmatic hiatus or the chest. The use of the hand to direct the passage of needles is to be avoided. While blunt needles have been shown to drastically reduce injuries, they are expensive and are not universally available.

8. Soiled linen - Soaking soiled linen for 30 minutes in 1:100 bleach solution (hypochlorite solution) kills the HIV virus completely. These can then be processed normally with washing and autoclaving as usual.

9. Metal Instruments - Metal instruments are washed with soap and water. They are then soaked in 2% Glutaraldehyde solution for 30 minutes to kill the virus. The sharp instruments are transferred to another container with fresh glutaraldehyde and soaked for a further six hours. The other instruments are autoclaved.

10. Plastic tubings - The anaesthetic tubings, tubings used for suction and those used in rotary pumps are all soaked in 2% Glutaraldehyde for six hours after cleaning with soap and water. Where available, these can also be subjected to ethylene oxide sterilization.

Unfortunately a lot of hype is created, particularly in the lay press, regarding the conduct of surgical procedures on AIDS patients. Special scheduling during weekends, summary

disposal of ''costly'' instruments and linen are all quoted as safety measures. A pragmatic view of the situation should convince us that operating on an AIDS patient is practically no different from operating on any other patient, if universal precautions are universally followed. Routine preoperative testing may be misleading because of the window period and adherence to universal precautions is a must.[65] One of the important defects with universal precautions is that it is not foolproof against needle injuries.

There are some new engineering devices which decrease needle stick injuries.[66]

1. Retractable lancets used for blood sampling by heel stabs and finger sampling;

2. Retractable needles used for injections and immunizations;

3. Shields added to needles for injections and venepuncture which are activated by the operator at the end of the procedure;

4. Protected disposable scalpels with a shield that can be activated before passing the instrument between staff and before disposal;

5. Blunt suture needles; and

6. Intravenous cannula with blunting or guarding of the needle of the introducer that is activated when removed from the plastic cannula.

Post exposure prophylaxis[64,67] (PEP)

Once the health worker is exposed, it is ideal to test the patient and asses the nature of injury by a team and the necessity of drugs as prophylaxis should be ascertained. Depending on the nature of the inoculum (percutaneous or mucosal splash, large or small blood volume, hollow needle or closed needle injuries) and the patient's viremic status (HIV positive, unknown or negative.) a two or three drug regimen can be started as early as possible, preferably 1-2 hours with a maximum of four weeks after the exposure. Post exposure counseling is to be done by a team of experts to ascertain the necessity of PEP.Certain suggestions are tabled for the recommendation of PEP. (Table 6)

Table - 6 : showing guidelines for PEP.

	Infection status of source				
Exposure type	**HIV +ve (1)**	**HIV +ve(2)**	**unknown HIV status**	**Unknown source**	**HIV -ve**
Small volume	Consider Basic 2 drug PEP	Recommend Basic 2 drug PEP	Generally no PEP needed. For source with HIV riskfactors. Basic 2 drug PEP	Generallyno PEP needed. Basic 2 drug PEP in likely settings.	NO PEP
Large volume	Recommend Basic 2 drug PEP	Recommend expanded 3 drug PEP	Generally no PEP needed. For source with HIV risk factors. Basic 2 drug PEP	Generallyno PEP needed. Basic 2 drug PEP in likely settings.	NO PEP

HIV +ve (1) : Asymptomatic HIV or a low viral load.

HIV +ve (2) : Symptomatic HIV or a high viral load.

PEP should be initiated as soon as possible. The interval within which PEP should be initiated for optimal efficacy is not known. If questions exist about which antiretroviral drugs to use or whether to use a basic or expanded regimen, starting the basic regimen immediately rather than delaying PEP administration is probably better. If appropriate for the exposure, PEP should be started even when the interval since exposure exceeds 36 hours. Initiating therapy after a longer interval (e.g., 1 week) might be considered for exposures that represent an increased risk for transmission. The optimal duration of PEP is unknown. Because 4 weeks of ZDV appeared protective in occupational and animal studies, PEP probably should be administered for 4 weeks, if tolerated.

Use of PEP when HIV Infection Status of Source Person is Unknown.

The following are recommendations regarding HIV postexposure prophylaxis : If indicated, starts PEP as soon as possible after an exposure. Reevaluation of the exposed person should be considered within 72 hours postexposure, especially as additional information about the exposure or source person becomes available. Administer PEP for 4 weeks, if tolerated. If a source person is determined to be HIV-negative, PEP should be discontinued.

PEP for Pregnant Health Care Personnel : If the exposed person is pregnant, the evaluation of risk of infection and need for PEP should be approached as with any other person who has had an HIV exposure. However, the decision to use any antiretroviral drug during pregnancy should involve discussion between the woman and her health-care provider(s) regarding the potential benefits and risks to mother and fetus. Certain drugs should be avoided in pregnant women. Because teratogenic effects were observed in primate studies, Efavirenz is not recommended during pregnancy. Reports of fatal lactic acidosis in pregnant women treated with a combination of Stavudine and Didanosine have prompted warnings about these drugs during pregnancy. Because of the risk of hyperbilirubinemia in newborns, Indinavir should not be administered to pregnant women shortly before delivery.

Recommendations for the Selection of Drugs for HIV PEP:

Two regimens for PEP are provided:

1) a “basic” two-drug regimen that should be appropriate for most HIV exposures Zidovudine (ZDV) 600mgperday + Lamivudine (3TC); 150 mg bid

Alternate basic regimens

- 3TC + Stavudine (d4T) 3TC: 150 mg twice daily, and d4T: 40 mg (if body weight is <60 kg, 30 mg twice daily) twice daily.
- Didanosine (ddI) + d4T ddI: 400 mg (if body weight is <60 kg, 125 mg twice daily) daily, on an empty stomach. d4T: 40 mg (if body weight is 60kg, 30 mg twice daily) twice daily. 2) An “expanded” three-drug regimen that should be used for exposures those pose an increased risk for transmission. It includes a basic regimen plus one of the following
- Indinavir (IDV)800 mg every 8 hours, on an empty stomach.
- Nelfinavir (NFV) 750 mg three times daily, with meals or snack, or1250 mg twice daily, with meals or snack
- Efavirenz (EFV)600 mg daily, at bedtime.
- Abacavir (ABC) 300 mg twice daily.

Antiretroviral agent generally not recommended for use as pep

- Nevirapine.

Conclusion

It should be emphasized that all practicing anaesthesiologists should be familiar with the disease its widespread ramifications, and use preoperative consultation with a team approach. The type of anaesthesia does not matter. Routine preoperative testing for HIV is acceptable but the concept of mandatory testing should be avoided and a HIV test should always be along with a pre and post test counseling. The problem of window period in HIV and the threat of occupational exposure to other transmissible diseases make strict adherence to universal precautions mandatory. We will see more innovative therapies and necessarily be informed about them as we provide anaesthesia care.

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CORRIGENDUM

The name of Dr. Nitin M. Mahantshetty, one of the author of an article titled "Tramadol for control of shivering (Comparision with pethidine)" published in Indian J. Anaesth. 2006; 50(6):28-32, was missed due to composing error.

The mistake is regretted. The same may please be incorporated.

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