HIV Infection and Orthopaedics: Current scenario and review of literature

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Abstract

INTRODUCTION

The Human Immuno deficiency Virus (HIV), was identified in 1983 by Barre – Sinoussi, Montagnier and colleagues at the Institute Pasteur, Paris(1) . The disease resulting is termed as Acquired Immune Deficiency Syndrome (AIDS).

In 1983 Jellis(2) from Lusaka, described the musculoskeletal manifestations of HIV – AIDS.

HIV is a retrovirus which encodes its genome in RNA and transcribes genome copies in the DNA using the enzyme reverse transcriptase. This occurs within the host cells such as human CD4 (T-helper) lymphocyte. HIV is characterized by fall in the CD4 cell count with an associated decrease in immunity, particularly in humoral immunity. Antiretroviral therapies reduce the viral load in the patients and restore the number of host CD4 cells. The infected individual is not cured but their immunity is at best partially restored.

Orthopaedic Surgeons practicing in areas with high prevalence of HIV infection may expect that up to 7% of their patients who undergo emergency procedures and 1% to 3% of those who undergo elective surgery will be HIV positive(3) . It is therefore important that orthopaedic surgeons treating patients infected with HIV should be familiar with one or other classifications as the musculoskeletal manifestations of HIV occur in different stages(4) and outcome after surgery is also influenced by the stage of the disease(5) .

CLASSIFICATION

The WHO staging system(6)(Table I) which groups individuals into four stages according to clinical features is followed most commonly. Continued WHO staging along with laboratory staging based on CD4 counts subgroups the individuals into 12 groups for further categorization (Table II).

Figure 1

Table 1 : WHO Staging for HIV Infection and Disease ()

WHO Stage	Characterised by	Examples
I	Acute(primary) HIV Infection or latent, asymptomatic or persistent generalized lymphadenopathy	Acute Sero Conversion illness in some patients
II	Cutaneous manifestations	Herpes Zoster. Seborrheic dermatitis, Recurrent URI < 10% body weight loss
III		Pul. TB < 1 yr ago. Severe bacterial infections. Weight loss >10%. Chronic diahorrea > 1month
IV	AIDS defining illness	Pneumocystic carinii pneumonia, Toxoplasmosis, Cytosporidiosis, CMV disease or retinitis.

Figure 2

Table 2: Combined WHO Clinical and Laboratory Staging

Clinical Stage	CD4 Count (cells / mm^3)		
	< 200	200 – 500	> 500
1	1 A	1 B	1 C
2	2 A	2 B	2 C
3	3 A	3 B	3 C
4	4 A	4 B	4 C

ARTHROPLASTY

Total or Hemi Joint arthroplasty is now a standard procedure being used all over the world for various joint disorders. Arthroplasties remain in situ for number of years in comparison to implants used for fracture fixation which can be removed after fracture union.

ARTHROPLASTY IN NON-HAEMOPHILIAC HIV – POSITIVE PATIENTS

It has been observed that inflammatory arthropathy and avascular necrosis is common in HIV positive patients(7) . Moreover antiretroviral therapy may also lead to AVN in

these patients which may be indication for arthroplasty. However at present no specific conclusions can be made about joint replacement in non-haemophiliac HIV-positive patients from various studies in the literature. But all authors have reported higher risk of early and late infections in these patients compared to healthy individuals, but much lower than in haemophiliacs with HIV.

A higher incidence of aspectic loosening has been reported for arthroplasties undertaken for avascular necrosis([8]) . Aspetic loosening and osteonecrosis are themselves both independent risk factors for late sepsis([9]) .

ARTHROPLASTY IN HAEMOPHILIACS

Haemophiliacs who are HIV negative have increased incidence of infections following arthroplasty([10]) . Haemophiliacs with HIV are probably a special group in that they are prone to bleeding around their joints. Moreover repeated transfusions increase the risk of bacteraemia in these patients. But these factors lead to increase risk of sepsis, particularly late sepsis in haemophiliacs in comparison to non-haemophiliac HIV positive patients.

HIV-positive haemophiliacs have increased rate of sepsis after arthroplasty and this increases with duration of time as is reflected in a Hicks et al([11]) retrospective study where he reported a deep sepsis of 18.7% (17/91) after primary procedures and 36.3% (4/11) after revision procedures. The mean follow up was 5.7 years. In his study the rate of sepsis free survival was 95% at 01 year, falling to 85% at 05 years and 55% at 15 years.

There are other studies which vary in statistical data but all have documented increased infection rate. However no report in literature suggests that arthroplasty accelerates progression of HIV([12]) or causes decline in CD4 counts.

TRAUMA

There is no comparative study in the literature about the outcome after polytrauma in symptomatic HIV – positive patients and healthy controls. However the prognosis is poor in HIV positive patients in intensive care unit after acute lung injury and adult respiratory distress syndrome([9]) .

The consensus now is that symptomatic HIV – positive patients are more susceptible to secondary infection after polytrauma.

FRACTURES

There is lot of literature about management of closed /open fractures and guidelines for elective surgery should include assessment of HIV – positive patients immune status including the CD4 count, history of opportunistic infections, serum albumin level, the presence of skin anergy and state of nutritious and general health([3]) .

CLOSED FRACTURES

The main problem remains of wound infection after internal fixation, late sepsis around implants, union of fracture and of functional outcome. Various studies have reported varying rates of wound infection after internal fixation of closed fractures.

Jellis([2]) have reported infection rate of 40% in symptomatic patients compared to Hoeckman et al([14]) who reported 24% infection rate. On the other hand Harrison et al([15]) in a prospective study with single blind trial and standard wound scoring system reported infection of 3.5% in HIV positive patients whether or not they were symptomatic using strict definition of infection.

OPEN FRACTURES

The main problem of infection is in open fractures where contamination has already occurred. All published literature shows high wound infection([4],[16]). Therefore in places with high sero prevalence for HIV, it is worth screening all open fractures for HIV, with the aim of avoiding internal fixation wherever possible. However this should not deviate the surgeon from standard management of early, adequate debridment of the wound with satisfactory fracture stabilization. Establishing or waiting for HIV status of the individual should not delay the initial treatment. The use of External fixator is options which can be considered safely in initial fracture stabilization.([16])

FRACTURE UNION

Can be adversely affected by HIV. There are no published reports of delayed or non union following internal fixation per se in HIV – positive patients. However theoretically altered immune status in compromised patient may mediate such a difference.

LATE SEPSIS

The decision when to remove implant in patients who undergo internal fixations remains controversial and various clinicians vary in opinion.There is always risk of sepsis around implants as the disease progresses and patients immunity waves. Moreover infection activation can occur from latent bacteria and late haematogenous seeding.

Therefore in our opinion it is safe to allow implant in situ till the fracture is united.

Horberg , Hurley([17]) et al have reported that HIV-infected patients had more incidence of post- operative pneumonia and higher 12 month mortality although other operative outcomes were comparable for HIV-infected and HIV- non infected patients.Viral suppression to fewer than 30 000 copies per milliliter reduced surgical complications.

CONCLUSION

HIV – positive patients should be treated on the merits of injuries and in the context of available resources and expertise. Regular medical attention, prophylactic antibiotic therapy, strict operating theatre discipline and early evaluation and treatment of possible infection and use of anti retroviral therapy are especially important in this setting.

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