

국내 한 병원에서 경험한 HIV 감염환자의 수술동향

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Trends of HIV-infected Patients Operated at Single Hospital

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Background: As anti-retroviral therapy has improved and the life expectancy of patients' with HIV in Korea has increased, an increased number of surgical procedures have been performed in this population. Therefore, in the current study, we investigated the trend in surgery conducted on patients with HIV in our hospital over the last 5 years.

Methods: We retrospectively reviewed the medical records of HIV-infected patients who underwent surgery under general or local anesthesia at our hospital between 2005 and 2010.

Results: The total number of surgeries performed in HIV-infected patients in the 5-year period was 95. Of these, 23 (24%) were performed under general anesthesia and 72 (76%) under spinal anesthesia. Anorectal surgery was the most commonly performed surgery (71 cases, 76%). The postoperative complication rate was 5.3% (3 cases of pneumonia and 2 of wound infection), with general anesthesia and time to discharge being identified as contributory factors. Preoperative CD4+ T cell count was not significantly associated with complications.

Conclusion: This study was the first to analyze the trends in surgical procedures performed in HIV-infected patients in Korea. Our study may be beneficial as a reference for clinicians who manage patients with HIV.

Keywords: Acquired immunodeficiency syndrome, HIV, Operation

Introduction

Since the first case of human immunodeficiency virus (HIV) infection in the Republic of Korea was detected in 1985, the cumulative number of HIV-infected patients have been increasing. According to Korean Ministry of Health and Welfare, 7,656 HIV-infected patients have been reported, as of December

2010. Among these, 1,364 (18%) expired and 6,292 (82%) have survived. The number of survived patients has been increasing every year. This is attributable both to the increasing number of new diagnoses and improved efficacy of advancing medical therapy. Now, it is thought that HIV infection has changed from a fatal condition to a chronic disease [1]. As numbers of HIV infected individuals continue to increase, the anesthesiologist is ever more likely to encounter HIV-infected patients in the operating room. Our hospital has one of the largest HIV cohort in the country, with a total patient number of 540. At this institution, management of HIV-positive patients has become a part of routine surgical practice. Although there are a lot of studies of Korean HIV-positive patients [2-4], to our knowl-

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edge, there are no papers investigating the trend of surgery performed under general or regional anesthesia in Korea.

The purpose of this study is to explore the nature and frequency of surgery performed in this hospital.

Materials and Methods

We retrospectively investigated the medical records of HIV-infected patients who underwent surgery under general or regional anesthesia at our hospital between September 2005 and September 2010. The study protocol was approved by the Institutional Review Board of our hospital.

Basic patient's characteristics of age, sex, diagnosis, operation name and operation date were recorded. Preoperative data of CD4+ T cell count (recorded within the 3 months prior to each surgical intervention), anesthetic method, the relationship of the operation with the HIV, time to hospital discharge and postoperative complication were recorded.

Statistical analyses were performed using SPSS software (SPSS 16.0, Chicago, Illinois, US). The

data are reported as means±SDs. For evaluating the factors related to postoperative complication, Fisher's exact test and Wilcoxon's rank sum test were used.

Results

A cohort of 83 patients underwent a total number of 95 operations during 5 years. Of these, the number of patients who underwent surgery twice or more were 9. Seventy nine patients (95%) were male and 4 patients (5%) were female. The incidence of surgery classified by sex and age was highest (34.1%)

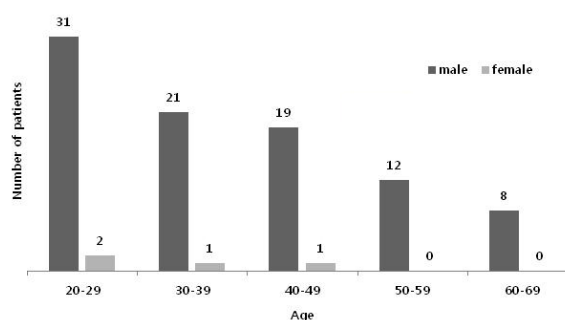


Fig. 1. Surgery incidences according to age and sex in 95 HIV-infected patients.

Table 1. The nature of operation

Operations	No. of patients	Operation name	No. of patients	Anesthesia	Postoperative complication
Anorectal	71	Fistulectomy, Anal abscess incision & drainage	14	Spinal	None
		Condyloma excision	53	Spinal	None
		Hemorrhoidectomy	4	Spinal	None
Abdominal	10	Exploratory-laparotomy	3	General	Wound infection (1)
		Colostomy	1	General	Wound infection (1)
		Wound closure	1	General	None
		Hernia repair	2	General	None
		Appendectomy	2	General	None
		Lymph node biopsy	1	General	None
Orthopedic	7	Fracture of extremities	3	General	None
		Arthroscopic surgery of knee	1	Spinal	None
		Spine surgery	3	General	None
Neurosurgery	3	Craniectomy	2	General	Pneumonia (2)
		Stereotactic aspiration	1	General	Pneumonia (1)
Thoracic surgery	1	Video assisted thoracoscopy	1	General	
ENT	1	Tympanic membrane surgery	1	General	None
OBGY	2	Cesarean section	1	General	None
		Electrosurgical excision procedure	1	General	None

Abbreviations: ENT, ear-nose-throat department surgery; OBGY, obstetric and gynecological department surgery.

in their twenties, followed by 23.1% in their thirties and 20.8% in their forties (Fig. 1).

The operations directly related to HIV-infection were 79 cases. Table 1 shows the operation names and incidences. Condyloma excision (53 cases) was the operation most frequently performed. Anal fistulectomy, anal abscess incision and drainage were the second frequent operation.

The cases of CD4+ T cell count below 200 cells/mm³ were 17 cases (20%), between 200 and 500 cells/mm³ were 42 cases (49%), and above 500 cells/mm³ were 26 cases (30%). Ten cases had no records. The average number of CD4+ T cell count was 366.4 cells/mm³. Twenty three (24%) cases were performed under general anesthesia and 72 (76%) cases were performed under spinal anesthesia. Postoperative complication occurred in five of the patients under general anesthesia, but did not occur in the patients under spinal anesthesia. The cases of complication were divided to three cases of pneumonia and two cases of wound infection. The duration of admission in the hospital after operation varied with the type of operation. The duration of hospital stay was 2.7 days for anorectal surgeries, 36 days for abdominal surgeries, 16.2 days for orthopedic surgeries and 28 days for neurosurgeries.

Table 2 showed the relationship between anesthesia and CD4+T cell count. The factors which relate to postoperative complication were the type of anesthesia and the duration of hospitalization ($P=0.001$, $P<0.001$), but the association with CD4+ T

cell count was not statistically significant.

Discussion

In the present study, anorectal surgery was the majority of the operation performed to HIV-infected patients. Most of the anorectal surgeries were performed under spinal anesthesia. This study has shown that there is no correlation between the pre-operative CD4+ T cell count and the postoperative complications.

The incidence of surgery was highest in the twenties and 74.7% of patients were between twenties to forties. The incidence was higher in male than female. They were parallel with the HIV occurrence trend of Korea. As of December 2010, male patients with HIV in their twenties to forties accounted for 77.7%. Separated by gender, males accounted for 91.7%, compared to 8.3% in females.

All of the three patients who underwent neurosurgery developed pneumonia and two of them expired. In the expired patients, HIV infection was detected during the preoperative evaluation and the CD4+ T cell count was noticed to be 31.4, 16.6 respectively. Therefore postoperative complication may be more related to the preoperative condition of patients rather than the general anesthesia itself.

In the present study, anorectal surgery was the most commonly performed surgery in the HIV-infected patients. This is in accord with a study published in the United Kingdom [5]. However, the study did not mention about the type of anesthesia. In our hospital, regional anesthesia was performed more than general anesthesia (72 cases of regional anesthesia vs. 23 cases of general anesthesia). According to Maehara et al. [6], a survey for anesthesiologists from a Japanese teaching hospital, general anesthesia was performed more than regional anesthesia (26% of regional anesthesia vs. 74% of general anesthesia). Anesthetic managements may differ depending on the anesthesiologist's preference and the severity of operation in Japan and South

Table 2. The nature of anesthesia

Type of anesthesia	General	Spinal	P-value
No. of patients	23	72	
No. of complications/ total (%)			
CD4+<200	2/6 (33.3)	0/11 (0)	<0.001
CD4+≥200	3/17 (17.6)	0/61 (0)	<0.001
Duration of discharge (days, means±SD)	21.8±23.2	2.7±5.8	<0.001

Abbreviations: CD4+<200, CD4+ T cell count <200 cells/mm³; CD4+≥200, CD4+ T cell count ≥200 cells/mm³.

Korea. Therefore, it requires further studies for major hospitals in this country.

In the present study, we compared the type of anesthesia without considering the severity of the operation. Further study is needed for this subject.

According to the CD4+ T cell count, the extent of the infection of HIV-infected patients is classified into mild, moderate and severe. Generally, more than 500 is classified into mild, between 200 and 500 is moderate and less than 200 is severe. These numbers can be expressed in terms of percentage, which are more than 24%, between 14 and 24% and less than 14% [7].

In the present study, CD4+ T cell count was not associated with postoperative complications. However, several studies show that low CD4+ T cell counts are associated with poor clinical outcomes in HIV patients [8,9]. Lin et al. [8] reported that low CD4+ T cell counts and hypoalbuminemia were associated with poor clinical outcomes in HIV infected patients undergoing abdominal aortic reconstruction. Furthermore, decrement in percent of CD4+ T cell proved to be the independent predictors of postoperative complications [9]. In the present study, there might be no statistical significance since minor surgery accounted for most of the surgery or the surgical cases of complication were too small.

A number of studies have shown that regional anesthesia can be safely used to immunocompromised patients regardless of the occurrence of postoperative neuraxial complications [10-12]. Perioperative complication did not occur after spinal anesthesia in our hospital. Thus, when regional anesthesia is indicated to HIV-infected patients and there are no absolute or relative contraindications (eg, coagulopathy, infection at the site of block placement), it can be used safely.

In our hospital, anesthesia management of HIV-infected patients is performed with the same protocol with blood-transmitted disease such as hepatitis B or C viral infection.

Infection control guidelines of our hospital has

been established according to the infection control guidelines of American CDC and Korean CDC. Also, the same guideline is applied to all operations performed in the operating room whether the patient is infected with tuberculosis, methicillin-resistant *Staphylococcus aureus* and other bacteria, including HIV infection.

As for the anesthesia of infected patients, it is important to select the simplest method of anesthesia and minimize use of the equipment. Extreme care is required when using the spinal needle because the main method of anesthesia is spinal anesthesia. Specifically, health professionals with hand injury are prevented from performing the procedure, and operators are recommended to wear double gloves and safety glasses. Also, throwing away used needles in the designated container prevents needle-stick injuries.

In conclusion, in HIV-infected patients, the most frequently performed surgery under anesthesia was anorectal surgery. They were mostly done by spinal anesthesia with no development of postoperative neuraxial complication.

Summary

배경: HIV 감염환자의 치료효과가 좋아지고 환자의 기대수명이 증가함에 따라 수술실에서 환자를 접할 기회가 많아지게 되었다. 이에 본 병원에서 지난 5년간 HIV환자들에서 어떠한 수술이 행하여졌는지 알아보려고 한다.

방법: HIV 감염환자 중 2005년부터 2010년 까지 본 병원에서 전신마취나 부위마취하에 수술한 환자의 기록을 후향적으로 검토하였다.

결과: 5년 동안 95건의 수술이 행하여졌으며 이 중 항문직장관련 수술이 가장 많았다(71건, 75%). 23건은 전신마취로, 나머지 72건은 척추마취로 진행되었다. 수술 합병증 발생비율은 5.3%였으며 폐렴 3건, 상처감염이 2건 이었다. 합병증 발생과 전신마취, 입원기간은 통계적인 연관성이 있었으나 수술 전 CD4+ T cell 수는 합병증 발생과는 연관이 없었다.

결론: 본 연구는 국내에서 HIV 감염환자의 수술동향을 분석한 최초의 연구이다. 이번 연구결과는 앞으로 수술실에서 HIV 감염환자를 접하는 의료진들에게 유익한 참고자료가 될 것이다.

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