

Hiv-infected patients malignancies in abdominal operations



Association of preoperative immunological parameters with tumor stage and postoperative sepsis in HIV-infected patients with malignancies undergoing abdominal operations

Abstract

Purpose Until recently, reports on malignancies in HIV-infected patients undergoing abdominal operations are scarce. Our study was to analyze association of preoperative immunological parameters with tumor stage and postoperative sepsis in HIV-infected patients with malignancies undergoing abdominal operations from a single institution.

Methods Data were analyzed for 32 HIV-infected patients with malignancies who underwent abdominal surgery between 2009 and 2013 in a surgical department.

Results A total of 32 patients with an average age of 50.6 years (range, 26-74 years) were included, in whom 78% (25/32) presented with non-AIDS defining malignancies (NADMs) that 64% (16/25) were advanced (III/IV), 47% (15/32) had postoperative sepsis and 3 (9.4%) died postoperatively. There are significant differences in preoperative CD4 percent, CD8 count, CD4/CD8 ratio and postoperative sepsis morbidity ($p < 0.05$), while age, white blood cells, hemoglobin, platelet and albumin, TNM stage of NADMs and length of hospital stays have no statistically different. ($p > 0.05$) for patients with CD4 count more than 200 cells/ μ L in comparison with those with CD4 count less than 200 cells/ μ L. Moreover, CD4 count, CD4 percent and CD4/CD8 ratio have no statistical differences between NADM patients ($n = 25$) with stage I-II and III-IV cancers ($P > 0.05$), but have significant

<https://assignbuster.com/hiv-infected-patients-malignancies-in-abdominal-operations/>

differences between patients (n= 32) with and without postoperative sepsis (p <0. 05).

ConclusionsOur study suggests that preoperative immunological parameters including CD4 count, CD4 percent and CD4/CD8 ratio correlate with postoperative sepsis morbidity, but are not associated with TNM stage of NADMs for HIV-infected patients with malignancies undergoing abdominal operations

Key wordsHIV/AIDS; Sepsis; CD4 count; CD4 percent; CD4/CD8 ratio.

Introduction

Human immunodeficiency virus (HIV) infection and acquired immune deficiency syndrome (AIDS) is a worldwide pandemic. In recent years, the number of HIV-infected patients is progressively increasing. With the introduction of highly active antiretroviral therapy (HAART) in 1996, survival for people infected with HIV and those diagnosed with AIDS has dramatically improved [1-3]. HIV-infected patients with weak immune systems are known to be at increased risk for certain cancers classified as AIDS-defining malignancies (ADMs) including Kaposi's sarcoma, non-Hodgkin's lymphoma and invasive cervical cancer. As treatments for HIV/AIDS improve and patients are living longer, the distribution of cancers in this population has undergone a dramatic shift in China. Despite the fact that cases of those AIDS-defining malignancies associated with AIDS progression have decreased, the number of non-AIDS-defining malignancies (NADMs) is on the rise [4-6]. As a result, the demand for surgical treatment in HIV-infected patients with malignant tumor is on the rise.

<https://assignbuster.com/hiv-infected-patients-malignancies-in-abdominal-operations/>

Until recently, several studies have shown that abdominal operations for HIV-infected patients have higher postoperative septic complications and mortality rate[7-10]. However, to our knowledge, no detailed reports focusing on HIV-infected patients with malignancies undergoing abdominal operations have been published. Thus, a better understanding of clinical characteristics of malignant tumors in HIV-infected patients undergoing abdominal operations is needed. The primary objective of this study was to summarize the clinicopathologic factors of patients with malignancies who underwent abdominal operations and to compare the results from shanghai public health clinical center, a designated tertiary care university hospital.

Methods

This study is a retrospective review of a maintained database from shanghai public health clinical center, a designated tertiary care university hospital for treatment of HIV-infected patients. All malignancy patients with a preoperative diagnosis of HIV infection or acquired immunodeficiency syndrome (AIDS) and without preoperative sepsis undergoing abdominal operations from September 2009 to September 2013 were retrieved and analyzed using the computerized patient record system. Demographic data collected included age, sex, diagnosis, tumor stage, laboratory variables, length of hospital stay, postoperative sepsis morbidity and mortality.

All patients took routine laboratory examinations before surgery and underwent a detailed evaluation including age, peripheral blood cells including preoperative white blood cell count, hemoglobin and platelet count, albumin levels, preoperative immunological parameters including CD4 count,

CD4 percent, CD8 count, CD4/CD8 ratio, TNM stage of NADMs and length of hospital stay. Patients whose preoperative CD4 counts <350 cells/ μ l started highly active anti-retrovirus therapy (HAART) and for those patients whose preoperative CD4 counts ≤ 200 cells/ μ l, the antibiotic and antifungal medications were started preoperatively to prophylaxis against pneumocystis carinii pneumonia (PCP) and fungal infection[11].

Postoperative sepsis was diagnosed as systemic inflammatory response syndrome (SIRS) plus infection according to 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definition[12].

Statistical analysis

All the data were analyzed by SPSS 16.0 statistical software (SPSS Inc., Chicago, IL). Results of all continuous data with normal distribution were presented as mean and standard deviation (SD) while continuous variables not normally distributed were presented as median and interquartile range (IQR). The Shapiro-Wilk test was used to test the normality of the data distribution. The Mann-Whitney U test or Student t test when appropriate were used to analyze differences in continuous variables. Fisher's exact test was used to compare categorical variables. A receiver operating characteristics (ROC) curve was also generated and the area under the curve (AUC) was calculated to evaluate the discriminatory ability of preoperative immunological parameters. All tests were 2-sided. $P < 0.05$ indicates statistical significance.

Results

A total of 32 HIV-infected patients with malignancies confirmed by pathology and without preoperative sepsis undergoing abdominal operations were enrolled in this study. None of the patients with malignancies diagnosed during the study period reported previous histories of malignant tumors. The average age was 50.6 years (range 26–74 years), with a male predominance (male: female ratio, 29: 3). There were seven AIDS-defining malignancies (22%, 7/32) including 2 hepatic lymphoma, 1 hepatosplenic lymphoma, 1 gastric lymphoma and 3 peritoneal burkitt lymphoma, and 25 patients with non-AIDS defining malignancies (78%, 25/32) including 9 colorectal carcinoma, 3 hepatic carcinoma, 8 gastric carcinoma, 1 esophageal carcinoma, 1 cholangiocarcinoma, 1 primary retroperitoneal tumor, 1 renal carcinoma and 1 gallbladder cancer. Most non-AIDS-defining-malignancy (NADM) (64%, 16/25) patients had stage III-IV cancers before surgery, and less manifested with stage I-II malignancies(36%, 9/25). TNM stage classification is according to the latest American Joint Committee on Cancer (AJCC) staging manual. Post-operative sepsis occurred in 47% (15/32) of patients who underwent abdominal surgical procedures along with three deaths (9.4%, 3/32)(one following resection of an esophageal cancer, another after total colectomy and right nephrotomy and ureterectomy in a patient with colon cancer and ureteral carcinoma, and a third after local resection of a late hepatic lymphoma). Sepsis was caused by polymicrobial infections (e. g. E. coli, Enterococcus, streptococcus pneumoniae, anaerobic bacteria and Candida albicans). The median length of hospital stay was 21 days. (Table 1).

Compared with patients with preoperative CD4 count less than 200cells/ μ L, there are significant differences in preoperative variables including CD4 percent, CD8 count, CD4/CD8 ratio and postoperative sepsis morbidity for patients with preoperative CD4 count more than 200 cells/ μ L ($p < 0.05$), while age, preoperative parameters including white blood cells, hemoglobin, platelet and albumin, TNM stage of NADMs and length of hospital stays have no statistically different. ($p > 0.05$) (Table 2).

Furthermore, there were no significant differences in the age, preoperative immunological variables including CD4 count, CD4 percent, CD8 count and CD4/CD8 ratio, other parameters including white blood cells, hemoglobin, platelet, albumin and length of hospital stay between NADM patients ($n = 25$) with stage I-II and III-IV cancers. ($P > 0.05$) (Table 3).

In addition, comparison of clinical data between patients with and without postoperative sepsis was shown in Table 4. When assessing malignancy patients with postoperative sepsis vs those without postoperative sepsis, there were no significant differences in age, the preoperative CD8 count, white blood cell count, hemoglobin, platelet count, albumin levels and length of hospital stay ($P > 0.05$). However, the preoperative CD4 count, CD4 percent and CD4/CD8 ratio were dramatically lower in the patients with postoperative sepsis ($P < 0.05$) (Table 4).

Finally, the relationship between the specificity and the sensitivity of preoperative CD4 count, CD4 percent and CD4/CD8 ratio measurement for the detection of postoperative sepsis is represented by a receiver operating characteristic (ROC) curve (Figure 7D). The area under the ROC curve (AUC)

was 0. 777 for CD4 count, 0. 746 for CD4 percent and 0. 721 for CD4/CD8 ratio.(Figure 1 and Table 5).

Discussion

To the best of our knowledge, reports on malignancies in HIV-infected patients undergoing abdominal operations are scarce. The incidence of NADMs has increased, while the relative frequency of ADMs has decreased due to introduction of highly antiretroviral therapy in 1996[4-6]. In this study, non-AIDS-defining malignancies made up 78% of all cancers diagnosed, in which the colorectal, gastric and hepatic cancers are the most common, however, the cancer incidence cannot be determined from our study.

In previously published reports of HIV-infected patients with colon cancer, hepatic cancer or lung cancer, median ages are relatively low, malignancies are more aggressive, stage of tumor at presentation is late and thus survival is short[13-19]. Data from our study also suggest that a younger patient age (mean age, 50. 6 years) at the time of malignant tumor diagnosis can be expected in patients with HIV infection. Moreover, most malignancies were detected at an advanced stage III-IV. Hence, it is important for regular cancer screening to take place and perhaps screening for malignant tumor should begin in a relatively younger population with HIV infection in order to detect cancer in its earliest stages, increase the curative resection rate of tumor and improve prognosis.

Clinically, HIV-infected patients with CD4 count less than 200cells/ μ L were generally diagnosed as AIDS and have been shown that have increased complications undergoing surgery[7-10]. Considering our limited patients <https://assignbuster.com/hiv-infected-patients-malignancies-in-abdominal-operations/>

included, we therefore tried to compare clinical data according to the preoperative CD4 count with a breakpoint value of 200cells/ μ L. By comparison, statistically significant differences in the preoperative CD4 percent, CD8 count and CD4/CD8 ratio were observed, which is easily explained by the fact that there are positive correlations among all the above immunological markers used to monitor the progression of HIV infection demonstrated by the earlier study [20-22].

Previous studies have demonstrated that the degree of immune suppression is correlated directly with the risk of the ADMs including Kaposi sarcoma and non-Hodgkin lymphoma, where the risk increases with declining CD4 cell count [23-25]. However, relationship between the degree of immune deficiency and the risk of the NADMs is controversial [23, 26-29]. To date, it seems that there are currently no data available to shed light on the effect of immune status on the development and progression of NADMs in HIV-positive patients. It is well-known that the CD4 count, CD4 percent, CD8 count or CD4/CD8 ratio is a key measure of the health of the immune system for HIV-infected patients. The lower the number, the greater damage HIV has done[20]. Surprisingly, by comparison, we do not find difference in HIV-infected patients with TNM stage I-II and III-IV of NADMs according to preoperative CD4 count stratification. Furthermore, there are also no significant differences in preoperative immunological variables including CD4 count, CD4 percent, CD8 percent and CD4/CD8 ratio between patients with stage I-II and III-IV NADMs, suggesting that immunological parameters are not associated with tumor stage. Although immune deficiency would impair the ability of the host to limit expansion of tumoral cells, immunosuppression

did not appear to correlate with tumor grade and stage demonstrated by a former published report on HIV-associated adenocarcinoma of the colon[15]. Based on these results, we believe that the host immune status is possibly not major factors to impact on tumor development and progression in HIV-patients with NADMs, which deserves to be further studied in the future.

In agreement with previous clinical studies, this study has shown that overall postoperative sepsis morbidity was 47% (15/32) and mortality 9.4% (3/32) [7-10]. We also demonstrated that lower preoperative CD4 counts $<200\text{cells}/\mu\text{L}$ is associated with an increased risk of sepsis morbidity, which is consistent with prior literature suggesting an association between severity of immune status and risk of septic complications after abdominal surgery[7-10]. However, advantage of this study is that our object used for comparison has a better consistency in that all our patients with malignancy are under semi-elective open abdominal surgery and type of procedure is similar. Of note, in addition, the statistical analysis in this study demonstrated that the preoperative CD4 percent and CD4/CD8 ratio were also dramatically lower in the patients with postoperative sepsis besides CD4 count, suggesting they may also correlate with postoperative sepsis. Moreover, the AUC analysis has shown that the preoperative CD4 count was slightly superior to CD4 percent and CD4/CD8 ratio in terms of predictive accuracy. To our knowledge, this study may be the first to show CD4 percent is associated with postoperative sepsis morbidity. On the other hand, our data also suggest that preoperative CD4 count is slightly superior to CD4 percent, and CD4 percent is a little better than CD4/CD8 ratio for the prediction of postoperative sepsis in malignancy patients with HIV infection or AIDS.

Our study does have several limitations. First, this study is a retrospective, single-centre study. Second, HIV viral load also as a marker of immune status for HIV-infected patients was not routinely taken preoperatively because of the limited hospital expenses. Third, we cannot obtain the exact duration of HIV infection and survival time of every patient in our study. Finally, only 32 HIV-infected patients with malignancies were studied, which is possibly not enough to draw a definite conclusion. Therefore, further large studies are needed to validate our findings.

CONCLUSIONS

Our results suggest that preoperative immunological parameters including CD4 count, CD4 percent and CD4/CD8 ratio correlate with postoperative sepsis morbidity, but are not associated with TNM stage of NADMs for HIV-infected patients with malignancies undergoing abdominal operations