Evaluation of Surgical and Non-Surgical Approaches in the Management of Perineal Infections in Patients with Leukemia: A Retrospective Study

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Abstract:

Introduction: Improvement of perineal infections in immunocompromised patients is usually done in different ways from other diseases, because these people usually have multiple problems and less power in dealing with diseases due to weak immune system. In the majority of cases, patients with malignancy present with anal pain and fever undergo clinical examination and incision under anesthesia even without evidence of edema or collection, while medical treatment in these patients may reduce the need for surgery. Therefore, the aim of this study was to investigate surgical and non-surgical approaches in the management of perineal infections in patients with cancers in Taleghani Hospital.

Material & methods: This study was a cross-sectional descriptive-analytical study on patients with leukemia who referred to Taleghani Hospital in Tehran due to perineal infection. Demographic information, mortality rate as well as type of disease and type of treatment as well as blood cell count including white blood cells, platelets and neutrophils and clinical signs of all patients were evaluated and finally the data were analyzed by SPSS software.

Results: Fifty patients with leukemia who underwent surgical or medical treatment for perineal infections were evaluated. The mean age of patients in this study was 36.6 ±11.95 years. Among patients, 21 (42%) were female and 29 (58%) were male. The most common leukemia's in patients were ALL, Hodgkin's lymphoma and AML with frequencies of 54%, 28% and 10%, respectively, and their most common clinical symptoms were pain, fever and chills (46%). 24 patients (48%) underwent surgery and 26 patients (52%) underwent medical treatment. In those who underwent surgical treatment, 37.5% died and in those who underwent medical treatment, 11.5% died (p-value = 0.001). The type of treatment was not related to age, sex, type of cancer and white blood cell and platelet count of patients, but a significant relationship was observed with patients' clinical symptoms. Also, the mean number of white blood cells and platelets in people who died was significantly lower than other people (p-value = 0.001).

Conclusion: Considering the prevalence of mortality in patients who underwent surgery, patient management through medical and conservative treatment can be effective in reducing mortality and in selected patients can be without imposing anesthesia and incision to the patient, Follow up the patient with medical treatment and prevented surgical stress.

Key words: Cancer, Perineal infection, Medical treatment, Surgery

Introduction

Perineum infections are formed by a set of dead cells and pus created in the perineum, internal anal sphincter, and Ischioanal, pelvic, and rectal sites. This condition is accompanied by inflation, redness, abscess, and severe pain, and in the case of lack of proper treatment, it can lead to death. These infections can be usually treated by surgery (creating a gap and discharging the infection) and topical anesthesia. In normal and healthy people, the immune system exerts a strong defense mechanism against the agents causing this infection and fights them. Lack of neutrophils is known as the main cause of these infections (1, 2). This infection usually affects men and in the case of no treatment, it causes high death rates (about 59%). Accordingly, this infection is known as an emergent surgery. Although many believe that the recurrence of this infection and the patients' death can be caused by the agents affecting the immune system such as chemotherapy, immunodeficiency, and injection of steroids (3, 4).

Tissue infections usually cause about 60% of deaths in people affected by immunodeficiency. It has been stated that perineal infection and abscess are more prevalent in the people affected by immunodeficiency. For example, the patients affected by myelodysplastic syndrome are prone to this infection due to the dysfunction of white blood cells (5, 6). The perineal infections in patients with immunodeficiency are treated by different methods than other diseases, because these patients have multiple problems and they are less strong in the face of different diseases. Furthermore, some of these people have less platelet units that lead to more bleeding. So, for these people, surgical methods are more complex and require further examination (7, 8).

To adopt the most appropriate therapeutic approach (choosing surgical or other methods) for perineal infections, there are still a lot of disagreements and the role of drug interactions is still unknown. So, this study aims to investigate the surgical and non-surgical approaches in managing perineal infections in patients with blood cancers in Taleghani hospitals from 2018 to 2020.

Materials and method

This study is a cross-sectional analytical research performed in 2018-2020 period. After approval of the research subject by the Ethics Committee and ensuring the privacy of the patients' information, we referred to the surgery ward of Taleghani Hospital in Tehran and collected the information of all the patients affected by different blood cancers and reporting perineal infection. The patients with an incomplete medical file were excluded from the study. Based on the surgeon's clinical judgment, all the patients received medical treatment or surgery. Data collection tool was a questionnaire including the information of age, gender, the type of blood disease, the type of treatment, death, white blood cells count, platelet, neutrophil, the symptoms of perineal sepsis, the results of clinical examination, fever, and toxic symptoms such as ulcer, pus, blood cell, fever, and erythema.

Ethical Considerations:

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran and registered with the protocol number "IR.SBMU.MSP.REC.1398.470".

Statistical Analysis:

All registered data were analyzed using SPSS software version 20 for Windows (SPSS, Chicago, IL). For descriptive statistics, the Mean ± SD index was used for quantitative variables with normal distribution. The chi-square test used for comparison of data between the two groups. *P* values of less than 0.05 were considered significant for all analyses.

Sampling and Blinding:

The sampling method was census and all patients with leukemia who had referred to Taleghani Hospital between 2018 to 2020 due to perineal infection were included in the study.

Results

The study investigated 50 patients. The patients' average age was 36.6 ± 11.95 (18-36 years old).

Table 1 presets the frequency distribution of gender, the type of blood cancer, and the clinical symptoms of the studied patients.

Table 2 presents the frequency distribution of the treatment type in terms of gender, death, the type of blood cancer, and clinical symptoms. The analyses performed by Chi-square showed no significant difference between the frequency distribution of the treatment type in terms of gender and the type of cancer (P >0.05). However, there was a significant difference between the frequency distribution of the type of treatment in terms of death and clinical

symptoms (P <0.05). The patients receiving a surgical treatment reported significantly higher frequency of death and sepsis.

According to the results of T-test, no significant difference was found between the mean number of WBCs and platelets in terms of the treatment type. However, the average number of WBCs and platelets was significantly higher in dead patients (Table 3).

Discussion

Chen et al. investigated 1102 patients with acute leukemia in Taiwan and they reported the prevalent of perineal infections about 6.7%. 31% of these people reported the recurrence of the infection. The findings showed that the patients with acute myeloid leukemia reported higher rates of recurrence than patients affected by lymphoblastic leukemia. 34% of patients affected by perineal infections underwent surgery, and fistula and recurrence were more common after the surgery. Meanwhile, 5% of patients died (9). On the other hand, Stremitzer et al. reported the increased stool incontinence in patients undergoing surgery for perineal infection (5).

Badgwell et al. investigated 100 patients with anorectal infection. In this study, 58 received a surgical and treatment, and 42 people received a non-surgical treatment. The most important factors related to surgical infection was anal abscess. In this study, the patients with sepsis and induration mostly received surgery. Similar to this study, there was a significant relationship between the patients' clinical symptoms and the decision for surgical or medical treatment. However, this decision had no relationship with gender and the number of white blood cells. Nevertheless, Badgwell et al. showed that the people with a below 50000 platelet mostly received a medical treatment. Meanwhile, patients receiving a surgical treatment reported a higher average age. Badgwell et al. showed that the recurrence of infection and fistula were respectively 17% and 9% in patients receiving a surgical treatment, and 2% of patient died because of the surgery complications. None of the mentioned conditions were observed in the medical treatment group (6). Studies have shown that deciding to choose a medical or surgical treatment in patients affected by perineal infection is so complicated, because several variables such as neutropenia, recent chemotherapy, thrombocytopenia, cancer prognosis and type, and unwillingness to delay the systemic treatment are effective in the final decision and the treatment results.

The primary reports of perineal infections in patients with cancer are focused on death rates and patients receiving a surgical treatment have reported increased death rates compared to patients receiving non-surgical treatment (5). A study has reported a 59% death rate because of rectal abscess in patients with cancer. Another study investigating 17 patients with blood cancers and perineal infections (infection, abscess, and ulcer) reported a 53% death rate that was higher than the present study (37.5%) (10).

These studies showed that in the case of early diagnosis, most of the perineal infections are not accompanied by abscess and they suggested careful selection of the surgical treatment type, incision, and drainage due to the high rates of recurrence (6). In another study, 20 patients with neutropenia and perianal infection were investigated and only 45% of them received a surgical treatment. Although this study was mainly focused on neutropenic patients, the significant finding was the surgery-related death (44%) compared to the death rate of patients receiving no surgery (9%), and this finding is consistent with the present study (8).

In another study performed in a national cancer center, selective surgery in patients with cancer and a 16% death in perineal infections was reported (31). Another study reported the occurrence of 82 stages of anorectal infection in 64 patients, and 37% of patients needed a surgical treatment over a 12-year period. No surgery-related death was reported in the study unless there was a severe and progressive infection accompanied by a necrotic tissue (11-13).

It seems that deciding about the patients' treatment in the case of perianal infection is a challenge in blood cancer cases. Surgery can be prioritized in the case of severe infections and necrosis. Meanwhile, patients with the symptoms of abscess and no underlying disease or dysfunction of laboratory parameters such as platelet and white blood cells can be treated by incision and drainage. However, it is more difficult to treat patients with neutropenia, thrombocytopenia, progressive or treated cancer, and systemic chemotherapy. Repetitive use of ultrasound and aspiration may be effective in selecting a treatment strategy, and non-surgical treatment are prioritized for these patients. However, follow up should be done for

all patients to check the symptoms of infection, treatment failure, and lack of improvement. The number of white blood cells can be considered an important factor to choose the patients needing surgery or check the improvement of infection. Nevertheless, this criterion is still being discussed.

Conclusion

Medical and conservative treatments are prioritized to manage patients with blood cancers and perineal infections, unless the patient is affected by severe infection and local or necrotic abscess that require drainage surgery. So, doing examination and incision under anesthesia for all patients should be avoided, and proper selection of patients can lead to better results.

Acknowledgements:
This manuscript is taken from the dissertation of a surgery assistant to obtain a specialized certificate from Shahid Beheshti University of Medical Sciences. The research proposal has been approved by the Research Council of the School of Medicine. The authors would like to thank all of the patients participating in the study for their cooperation and contribution

Conflict of Interest:
The authors declare that there is no conflict of interest in the publication of this paper.

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Table 1. Frequency distribution of gender, type of leukemia and clinical symptoms in the studied patients

Variables	Number	Percent (%)
Gender		

Male	29	58
Female	21	42
Type of Leukemia		
CLL	2	4
ALL	27	54
AML	5	10
Hodgkin Lymphoma	14	28
CML	2	4
Clinical Symptoms		
Ague & pain	23	46
Pain & induration	8	16
Pain	11	22
Sepsis	8	16

Table 2. Frequency distribution of type of treatment by variables: gender, mortality, type of leukemia**,** clinical symptoms in the studied patients

Variables	Surgery Treatment	Medical Treatment	P-value*
Gender			
Male	15 (62.5%)	14 (53.8%)	0.53
Female	9 (37.5%)	12(46.2%)	
Mortality			
alive	9(37.5%)	23(88.5%)	0.001
dead	15(62.5%)	3(11.5%)	
Type of Leukemia			
CLL	1(4.2%)	1(3.8%)	
ALL	14(58.3%)	13(50%)	0.86
AML	3(12.5%)	2(7.7%)	
Hodgkin Lymphoma	5(20.8%)	9(34.6%)	
CML	1(4.2%)	1(3.8%)	
Clinical symptoms			
Ague & pain	6(25%)	17(65.4%)	
Pain & induration	8(33.3%)	0(0%)	0.001
Pain	2(8.3%)	9(34.6%)	
Sepsis	8(33.3%)	0(0%)	

*chi-Square test

Table 3. Comparing the mean of WBC and Platelets according to the type of treatment and Mortality in the studied patients

Variables	WBC(Mean ± SD)	Platelets(Mean ± SD)
Type of Treatment		
Surgery	3142.08 ± 3593.7	83458.3 ± 75577.7
Medical	2734.6 ± 1759.07	118669.2 ± 80264.3
P-value*	0.609	0.11
Mortality		
alive	3825 ± 3011.9	131521.8 ± 72388.1
dead	1339.44 ± 1190.2	48872.2 ± 62638.8
P-value*	0.002	0.001

*T-test