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ORIGINAL ARTICLE

A Study of Patients with Acute Superficial Abscesses at Kosti Teaching Hospital

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Abstract:

Background: Acute superficial abscesses are among the most common clinical conditions requiring surgical treatment at the Accident and Emergency Department of Kosti Teaching Hospital. Unfortunately, epidemiological, clinical and bacteriological information on both patients and causative micro-organism are lacking or non-existent of patients with acute superficial abscess in White Nile State –Sudan. In this era of evidence based medicine, obtaining such information helps in making guidelines for treatment and prevention of this common surgical problem.

Objectives: To determine epidemiological characteristics, risk factors and causative organism and its antibiotic susceptibility of the acute superficial abscesses in Kosti Teaching Hospital.

Patients and Methods: a prospective observational descriptive study, involving a convenience sample of patients who presented to Kosti teaching hospital emergency department with acute superficial abscesses in the period from May 2012 to July2012. . A pro-forma was used to collect personal, clinical, operative and bacteriological data of these patients**.** The incision and drainage of the abscesses were performed as a day case. Swabs of pus were sent to laboratory for culture and sensitivity tests.

Results: A total of 62 patients were included in the study. There were 40(64.5%) males

and 22(35.5%) were females. 82.3% of the patientswere below 40 years. Forty three (69.3%) of the patients had no predisposing cause, trauma obtained in17 (27.4%) patients, 4 (6. 4%) patients were diabetics and 2(3.2%) patients had history of intramuscular injection The most common site of the abscess was the upper limbs (45.2%), followed by lower limbs (24.2%). Staphylococcus aureus was isolated from most of the patients (82.2%).

Conclusion: Acute superficial abscesses mainly affect the extremities of the young who have no known predisposing factors. The main causative organism of these abscesses was the staphylococcus aureus. A relatively cheap antibiotic like ciprofloxacin and gentamicin can be used for treatment of acute superficial abscesses. Guidelines for incisions and drainage and antibiotic treatment of abscesses must be established.

Key words: Acute superficial abscesses.

Introduction:

Acute superficial abscesses are among the most common clinical syndromes requiring surgical treatment at the Accident and Emergency Department of Kosti Teaching Hospital (Kosti, Sudan). Surface injury or disruption by wetness and maceration may allow the skin flora to enter the body and occasionally cause serious infection. Minor trauma that usually passes unnoticed can also provide the predisposing injury for the development of superficial abscesses [(1)].

In developing countries, abscesses are more frequently secondary to injection involving non-sterile techniques including the use of contaminated needles. Most of these are gluteal abscesses due to intra-muscular injection [(2)]. Sometimes no obvious cause or lack of predisposing factors can be noted among patients presenting with superficial abscesses [(1, 3)]. In a series of 391 children with soft tissue infection, clearly predisposing factors were identified in only 38.4% of the cases. The abscesses were mainly due to trauma or adjacent skin sepsis [(3)].

Major risk factors for superficial abscesses include malnutrition, obesity and metabolic diseases such as diabetes, uraemia and jaundice. Disseminated malignancy may also be included, together with immuno-suppression caused by radiotherapy, chemo-therapy or AIDS. These risk factors increase the risk of sepsis and abscess formation postoperatively, even after minor operations [(4, 5)], but their link with community-acquired superficial abscesses are still not clear. In

abscesses with an infectious etiology, Staphylococcus aureus is by far the most frequent cause in anatomical sites such as the axilla, groin, perineum and post partum breast as well as injection sites [6]. Unfortunately, epidemiological, clinical and bacteriological information on both patients and causative micro-organism are lacking or non-existent of patients with acute superficial abscess in White Nile State –Sudan. In this era of evidence based medicine, obtaining such information helps in making guidelines for treatment and prevention of this common surgical problem. This study was designed to determine epidemiological characteristics, risk factors and causative organism and its antibiotic susceptibility of the acute superficial abscess in Kosti Teaching Hospital.

Patients and Methods

Kosti Teaching hospital is the main referral hospital in the White Nile state, Sudan. Its emergency department is the biggest one in the state and is visited by patients from Kosti and adjacent rural areas. In the emergency department, patients with superficial abscesses are usually seen and treated as day cases, unless prolonged hospital stay is indicated. We conducted a prospective observational descriptive study, involving a reasonable sample of patients who presented to Kosti teaching hospital emergency department with acute superficial (cutaneous and subcutaneous) abscesses in the period from May 2012 to July20012. Inpatients, with hospital acquired abscesses (HA-A), were excluded. A pro-forma was used to collect personal, clinical, operative and bacteriological data of these patients**.**

The operations were done in a theatre dedicated for septic cases. The incision and drainage of abscesses were done according to a standardized procedure under different anaesthetic techniques as thought appropriate.

The purulent material collected under strict aseptic techniques using sterile needles and syringes or sterile cotton swabs. Each specimen was cultured on three plates, two of which were blood agar (one for aerobic and the other for anaerobic incubation) and the third plate was MacConkey agar. All plates were incubated at 37 C, one plate of blood agar and MacConkey agar incubated aerobically for 24 hours and the second plate of blood agar incubated anaerobically for 24-48 hours. Catalase test, coagulase test, DNAase test and mannitol salt agar were used for identification of Gram positive cocci organism and oxidase test. KIA agar, citrate test, urease test and indole test were used for identification of Gram negative rods.

Disc diffusion technique was used for antibiotic susceptibility tests. Data were summarized and grouped into a master sheet, computed and analyzed with statistical package of social sciences (SPSS) software program.

Results:

A total of 62 patients were included in study. 40 (64.5%) were males and 22 (35.5%) were females with a M: F ratio of 1.8:1. 82.3% of the patients were below 40 years (Table 1). Forty three (69.3%) of the patients had no predisposing cause, but history of trauma was obtained in17 (27.4%) patients, 4 (6. 4%) patients were diabetics and 2(3.2%) patients had history of intramuscular injection. The anatomical sites of the abscesses revealed that most of the abscesses occurred in the upper limbs (45.2%), followed by lower limbs (24.2%) (Table2).All the patients in this study presented with pain, fever, swelling and 28 (45.2%) patients had sinus discharge in addition to the previous symptoms.

Bacteriology (culture and sensitivity) tests were done on pus specimens obtained from all 62 patients. Staphylococcus aureus was isolated in 51(82.2%) of the specimens, in 10 (16.1%) specimens there was mixed growth Staphylococcus aureus and Pseudomonas auregunosa and Clostridium perfringens in 1 (1.6%) specimen. All isolated organisms were highly sensitive to Ciprofloxacin, Amikacim and Gentamycin (100%)., 40(78.4%) and 42(82.4%) of the growths of Staphylococcus aureus showed resistance to the Ampicillin, Cefotaxime and tetracycline respectively were 43(84.3%) sensitive to Chloramphenicol (Table 3).Pseudomonas showed resistance to Ampicilin in 8 (80%) of the growths and4 (40%) for each of Cefotaxime, Chloramphenicol and Tetracyclin in 5(50%) patients (Table 4).

Table 1: Age distribution of patients with abscess (n=62).

Age Group	Number of the Patients	Percentage %
0 - 20	26	41.9
21- 40	25	40.4
41- 60	8	12.9
61- 80	3	4.8

Table 2: Anatomical site of abscess (n=62).

Anatomical site	Number	Percentage %
Upper limb	28	45.2
Lower limb	15	24.2
Head and neck	5	8.1
Trunk	1	1.6
Breast	4	6.4
gluteal	4	6.4
Others	5	8.1

Table 3: Sensitivity of Staphylococcus aureus to commonly used antibiotics (n=51)

Antibiotic	Sensitive		Resistant	
	n	%	n	%
Ampicillin	11	21.6	40	78.4
Cefotaxime	11	21.6	40	78.4
Ciprofloxacin	51	100	0	0.0
Gentamicin	51	100	0	0.0
Amikacin	51	100	0	0.0
Chloramphenicol	43	84.3	8	15.7
Tetracyclin	9	17.6	42	82.4

Table 4: Sensitivity of Pseudomonas auregunosa to commonly used antibiotics (n=10).

Antibiotic	Sensitive		Resistant	
	n	%	n	%
Ampicillin	2	20%	8	80%
Cefotaxime	6	60%	4	40%
Ciprofloxacin	10	100%	0	0.0%
Gentamicin	10	100%	0	0.0%
Amikacin	10	100%	0	0.0%
Chloramphenicol	6	60%	4	40%
Tetracyclin	5	50%	5	50%

Discussion:

A community acquired abscess (CA-A) is an abscess acquired in the community where the patient had not been in hospital for at least four weeks before acquiring the abscess [7]. In this study the majority of the patients (82.3%) were aged below 40 years with predominance of males.

This is similar to the finding of Mahdi *etal* at Khartoum teaching hospital [8] and El shallaly *etal* at Khartoum North teaching hospital [7]. Superficial abscess predominantly affect younger and middle age male population as was also reported earlier [1, 9, 10]. Some studies reported females' predominance. [11, 12] Affection of younger and middle aged male reflects the fact that abscesses inflict the economically active age group.

The majority of abscesses (69.3%) occurred in previously healthy patients without a known predisposing factor. similar results were reported by El shallaly *etal* [7] and Mahdi *etal* both from Sudan and Gorak *etal* from USA [13].

The percentage of patients who had no clear cause for abscess development is higher than figures reported before, where trauma and infection accounted for an increased occurrence of abscess [1, 3]. The absence of recognized cause can be attributed to trauma which is too minor to be recognized by the patients [1,12,14].or abscesses arising, in for instance, obstructed sebaceous or sweat glands [12],duct ecstasies [15,16] and as a sequence of blood borne bacteria [17,16].

A history of some sort of trauma was found in (27.4%) of the patients and 6.4% of the patients in this study were diabetics giving this low percentage in this study due to the fact that 82.3% of our patients are young (below 40 years).

In this study 3.2% of patients had a history of intramuscular injections of drugs other than chloroquine, which we used to see in the past [8]. This may be due to the fact that chloroquine is no longer used as a treatment of malaria in Sudan.

Clinically about two thirds or more of the abscesses were in the limbs: 45.2% in the upper limb and 24.2% in the lower limb. This is different from the study at Khartoum teaching hospital where head and neck had the highest percentage [8].

In this study, the diagnosis of the abscess was made mainly on clinical grounds. All the patients in this study presented with pain, fever and swelling, and 45.2% of them had discharging sinuses. Simple superficial abscesses are not known to be associated with systemic manifestation of infection [5], unless there are other factors such as immune suppression, diabetes or abuse of injected drugs [18, 19]. Delay in surgical drainage is known to result in spread of infection and systemic manifestation [15, 20]. In this study, drugs abuse and immune-suppression were not reported, diabetes was not common and most of the patients were young and healthy. The presentation of patients in this study with fever, swelling and discharging sinuses indicates that they came late to surgical causality in Kosti teaching hospital; this late presentation may be due to either lack of medical services in rural areas from which the patients came, or due to application of herbal medicine at the site of the abscess.

Bacteriological (culture and susceptibility) tests on pus specimen showed that staphylococcus aureus was the causative organism in the majority (82.2%) of cases. This was conforming to most previous studies [7, 8] and in contrast to the other study where streptococci were the main cause of extremity abscesses [21].

In this study, the antibiotic susceptibility test of staphylococcus showed high sensitivity to ciprofloxacin, gentamicin, amikacin and chloramphinicol, this differs from the antibiotic susceptibility test reported by Elshallay etal [7] in which staphylococcus showed high sensitivity to vancomycin, imipenem, ciprofloxacin and cefotaxime and low sensitivity to gentamicin.

This study also showed high resistance of staphylococcus aureus to the following commonly used antibiotics: tetracycline, cefotaxime and ampicillin, so these few drugs can no longer be recommended for prophylaxis and treatment against

staphylococcus infections in Kosti area. This high resistance of staphylococcus aureus to commonly used antibiotics indicates an abuse of antibiotics in the community which may occur at the level of patients, doctors and pharmacists.
Pseudomonas spp. in this study was highly sensitive to ciprofloxacin, gentamicin, cefotaxime and amikacin and had some sensitivity to cefotaxime, chloramphinicol, tetracycline and resistant to ampicillin. The studies on antibiotics susceptibility of microorganisms give the treating doctors information on microorganisms antibiotics susceptibility in cases when the empirical use of antibiotics is important and/or urgent before the result of culture arrives.
Surgical incision and drainage of an abscess is the only treatment of the abscess. Antibiotics may be used only in the early inflammatory (cellulitis) stage to abort the formation of abscess or to prevent the recurrence after drainage especially in the diabetics and other immune compromised patients [(7)].

Conclusions:

Acute superficial abscesses mainly affect the extremities of the young who have no known predisposing factors. The main causative organism of acute superficial abscesses is the staphylococcus aureus. A cheap antibiotic like ciprofloxacin and gentamicin can be used for treatment of acute superficial abscesses because it had high sensitivity to staphylococcus aureus and pseudomonas spp. The effective treatment of a formed abscess is incision and drainage and antibiotic should not be given to patients with formed abscesses as it will not help as well as it can form an antibioma. The antibiotic susceptibility test tables have to be updated from time to time and from place to place to cope with the microorganism changing antibiotic resistance. Guidelines for incisions and drainage and antibiotic treatment of abscesses must be established. Measures to improve hygiene like, hands washing can possibly reduce the incidence of superficial abscesses among people. Additional researches and studies are needed to provide more information about superficial abscesses.

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