

Clinico-Bacteriological profile & Effect of Home remedies on Acute Abscess

Patel VK¹, Patel U², Gaharwar APS³, Shrivastava GP⁴, Gupta R⁵, Patel NP⁶

¹Dr. Vishnu Kumar Patel*, Assistant Professor (Surgery), ²Dr. Umesh Patel[#], Associate Professor (Pediatrics), ³Dr. APS Gaharwar*, Professor (Surgery), ⁴Dr. GP Shrivastava*, Professor (Surgery), ⁵Dr. Rachna Gupta*, Associate Professor. *All are affiliated with SS Medical College, Rewa (MP), ⁶Dr. Narmada Prasad Patel[#], Associate Professor (Medicine), [#]Affiliated with L N Medical College, Bhopal (MP), India

Address for Correspondence: Dr Vishnu Kumar Patel: drvishnu.patel@gmail.com

Abstract

Acute abscess are very common in tropical countries like India. We have conducted this study to evaluate clinical & etiological profile of abscess. **Design:** Prospective study. **Methodology:** All patients with soft tissue abscesses either admitted in Surgery Department or attended Surgical OPD during the study period. Cases of small superficial abscesses managed in Out Patient Department. Data regarding the age, sex, hemoglobin, location of the abscess and cause if any, was tabulated. **Results:** Total 1065 cases were included in this study, 63.57% were male and 36.43% were female. Most common age groups were between 6-20 years (22.25% male and 10.89% female, total 33.15%) and 21-40 years (20.66% male and 14.02% females, total 35.31%). 81.78% patients belonged to lower socio-economic status. Pain and swelling were the most common presenting symptoms (99.06% and 99.15% respectively). Lower limb was the commonest site with 33.34% followed by upper limbs (23.66%). There was high percentage (40.46%) of pre-hospitalization home based interventions that increased the complication rate. *Staphylococcus aureus* was most common culprit organism in 72% cases (80 out of 111 cultures done). Causes were not known in 79.53% cases, but 7.32% cases developed abscesses after intramuscular injections. **Conclusion:** Soft tissue abscesses are more prevalent in lower socio-economic group and rainy season. In most of the cases, the cause is unknown; trauma and intramuscular injection are the leading underlying known causes of these abscesses. Use of home remedies had increased the complication rate.

Key words: Abscess, Soft Tissue Abscess, Bacteriological

Introduction

Infection and infectious diseases will last as long as humanity itself. Most surgical infections are result of damaged host defenses, especially injury to the epithelial barrier that normally protects the sterile internal environment from exogenous and endogenous bacteria. The most obvious example of surgical infection is an acute superficial abscess.

Skin and soft tissue abscesses involve microbial invasion of the skin and underlying soft tissues. They have variable presentations, etiologies and severities. Acute abscesses are very common in tropical countries like India and common cause of morbidity. Hot and humid climate contributes to a higher incidence [1]. Whereas certain types of abscesses are decreasing in prevalence in the western world, situation is quite

different in most developing countries [2]. Abscesses are common presenting complaint in adult and pediatric populations. Due to poor economic condition, poor hygiene, lack of education and malnutrition, we frequently encounter these abscesses and related complications, sometimes life threatening.

With the improvement of healthcare, accessibility of the poor people to healthcare system and development of radiological imaging like USG, CT scan, MRI as diagnostic tools, incidence of complication of abscess is becoming less due to early diagnosis and interventions. Many of the smaller abscesses are treated as out-patients but with large abscesses and who were toxic need admission and were usually drained under general anesthesia.

Because many time abscesses and soft tissue infections are not cultured, most common cause generally remains

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uncertain, although staphylococcus aureus and beta hemolytic streptococci are often suggested as being the most important. The importance of soft tissue abscesses lies in the morbidity and occasional mortality. The purpose of this prospective study is to determine the current status of acute abscesses in central India in terms of distribution, predisposing factors, etiology and outcome.

Aims and objectives

1. To study the incidence of abscesses in general population.
2. To explore age and sex variation along with relationship to socioeconomic status.
3. To study clinical presentations in relation to site and nature of abscesses.
4. To study common pathogens responsible.
5. To evaluate result of treatment and complication

Material and Methods

The present study was carried out in 1065 patients, who attended surgical OPD, casualty and admitted in surgical ward of tertiary care teaching hospital in central India over a period of one year.

Exclusion criteria-

1. Deep seated visceral abscesses like liver abscess.
2. Bony abscesses.
3. Residual abscess following medical or surgical intervention.

4. Patients with known immunodeficiency conditions.
5. Abscess developed after use of cytotoxic drugs.

Clinical diagnosis of acute abscesses was made on the basis of classical symptoms and sign. The case record of all the patients was reviewed and tabulated for age, sex, occupation, socio-economic status and duration of disease. Abscesses were examined in details for number, site, size, color, local temperature, tenderness, fluctuation, discharge, overlying skin, regional lymph nodes and loss of function, predisposing cause (intramuscular injection, trauma, application of indigenous substances and hot fomentation), risk factors (diabetes mellitus, hypertension, tuberculosis and addiction).

After the clinical diagnosis was made, complete laboratory investigation done including hemoglobin, TLC, DLC, RBS, blood urea and blood culture were done in selected cases.

Incision and drainage was carried out under local or general anesthesia, depending on need. Pus was sent for culture and sensitivity test. Culture and sensitivity report (C/S) was available in 111 cases. Empirical antibiotic was started in all cases and modified later according to C/S report if needed. Post-operative dressings were done daily.

Result of the treatment and antibiotic therapy were recorded in respect to mean healing time along with result of pus culture and sensitivity.

Results

Table No 01: Distribution of cases according to Age, Sex & Socio-economic status (n=1065)

S. No	Age (Years)	Male		Female		Total		Socio-economic status			
		No	%	No	%	No	%	S. No	Class	No	%
1.	0-5	71	06.67	52	04.88	123	11.55	1.	Lower	871	81.78
2.	6-20	237	22.25	116	10.89	353	33.15				
3.	21-40	220	20.66	156	14.62	376	35.31	2.	Middle	175	16.43
4.	41-60	100	09.39	48	04.53	148	13.90				
5.	61-80	46	04.32	16	01.51	62	05.82	3.	Upper	19	01.78
6.	≥ 80	03	00.28	00	00.00	03	00.28				
Total		677	63.57	388	36.43	1065	100	Total		1065	100

It is evident from Table No-01 that majority of patients with acute abscesses were male (63.57%) with male: female ratio was 1.7:1. About 80% patients were under 40 years of age. Most common age group was 21-40 years (35.31%). Youngest patient was a 9 days old male baby and oldest being an 85 years old male.

Table No 02: Distribution of cases according to site of abscesses, cause, presenting symptoms and signs (n=1065)

S. No	Site	Total		Symptoms			Sign (n=304)-IPD		
		No	%	Complaints	No.	%	Findings	No.	%
1.	Lower limb	354	33.24	Pain	1055	99.06	Tachycardia	139	45.72
2.	Upper limb	252	23.66	Swelling	1056	99.15	Pallor	85	27.96
3.	Thorax	102	09.58	Fever	578	54.27	Fever	42	13.82
4.	Breast	87	08.17	Discharge	124	11.64	Sepsis	15	04.93
5.	Trunk	87	08.17	Loss of function	07	02.30	Regional Lymphadenopathy	11	03.62
6.	Head & Neck	65	06.10	Cause of Abscesses			Tenderness	304	100
7.	Perineum	68	06.38	Not known	847	79.53	Fluctuation	267	87.80
8.	Multiple	50	04.69	Trauma	140	13.15	Skin changes	283	93.12
Total		1065	100	Post injection	78	07.32			

It is evident from table No-2 that incidence of abscesses were more common in lower limb (33.24%) with head & neck being the least common site (6.10%). Multiple site abscesses were very rare (4.69%). Pain and swelling were most common symptoms (99.09% & 99.15% respectively) followed by fever (54.27%). Tenderness, skin changes (red & shiny, abscess pointing, dark pigmentation, excoriation & ulceration) and fluctuation were most common local signs (in 100%, 93.12% & 87.8% respectively). Tachycardia and pallor were common systemic findings in 45.72% and 27.96% cases. This is also evident that in 79.53% cases, cause is not known. But this is alarming that 7.32% (78 patients out of 1065) abscess developed after intramuscular injections. 62 patients had gluteal abscess and 16 patients had abscess over arm.

Table No 03:Pre-hospitalization intervention/ treatment (n=304)

S. No	Type of intervention		No. of cases	%	Total	Grand Total
1.	Application of local remedies	Non-medical intervention	61	20.07	40.46%	74.67%
2.	Hot fomentation		50	16.45		
3.	Massage		12	03.94		
4.	Antibiotics and analgesics	Medical intervention	58	19.08	34.21%	
5.	Analgesic only		41	13.49		
6.	Incision and drainage		05	01.64		
7.	No treatment		77	25.33	25.33	
Total			304	100	100	100

It is evident from table no-04 that majority of patients (74.68%) received treatment before admitted to the surgical ward. 34.21% patients have received medical treatment, most of the from unqualified persons. 40.47% patients used home remedies (non-medical interventions) to deal abscesses.

Table No 04: Distribution of different laboratories results

S. No.	Hemoglobin (Gm%)			TLC			RBS (mg%)			Puss culture		
	Range	No	%	Range	No	%	Range	No	%	Result	No	%
1.	3-6	04	01.92	5500-8500	37	17.79	<130	198	81.48	Positive	111	55.55
2.	7-10	132	63.46	8500-11000	75	36.06	130-160	33	13.58	Negative	89	44.45
3.	>10	72	34.62	>11000	96	46.15	>160	12	04.94	-	-	-
Total		208	100		208	100		243			200	100

It is evident from above table that 65.38% patients of our study were anemic. Total leucocyte count was raised only in 46.15% cases. Majority of patients (81.48%) were non diabetic, only 4.94% cases were diabetic, but 13.58% cases were in pre-diabetic range. This is also evident that 200 randomly selected cases for puss culture, 55.55% cases were positive for causative organism.

Table No 05: Distribution of culture & sensitivity of organism (n=111)

S. No	Organism Grown	No of cases	%	Amikacin	Genta micin	Ciprofl oxacin	Ceftri axone	Cefur oxime	Cefota xime	Clarithr omicin
1.	Staphylococcus aureus	80	72	93.7	81.0	50.0	84.3	87.5	55.0	82.5
2.	Klebsiella aeruginosa	12	11	91.0	83.0	25.0	83.0	50.0	50.0	75.0
3.	E. coli	10	09	70.0	90.0	80.0	70.0	70.0	70.0	80.0
4.	Pseudomonas	09	08	78.0	66.0	20.0	67.0	55.0	55.0	66.0

It is evident from Table No-05 that staphylococcus aureus was the most common organism cultured in 72% (80 out of 111 positive cultured) of samples. Klebsiella aeruginosa, E. coli and pseudomonas were the other common organism, cultured in 11%, 09% and 08% of samples. Staphylococcus aureus was highly sensitive to amikacin, cefuroxime and ceftriaxone (93.7%, 87.5% and 84.3%), Klebsiella was highly sensitive to amikacin & ceftriaxone (91% and 83%), pseudomonas was highly sensitive to amikacin & ceftriaxone (78% and 67%) and E. coli was sensitive to gentamicin & ciprofloxacin (90% and 80% respectively).

Majority of patients (61.51%) shown good result after I&D along with proper antibiotic coverage and discharged within 7 days. There is delay in healing with few patients (28.95%) and discharge after 2 weeks only. 9.54% patients shown poor healing and needed prolong stay and antibiotics course usually more than 3 weeks. These patients had some underlying disorders.

Discussion

Acute abscesses are one of the common surgical emergencies. A wide range of acute abscesses occurs in tropical environment like India and is an important cause of morbidity. An abscess is a tender mass generally surrounded by a colored area from pink to deep red. Abscesses occur when an area of tissue becomes infected and body is able to wall off the infection to keep it from spreading. Abscesses are often easy to feel by touching, the middle of an abscess is full of pus and debris, painful and warm to touch. Abscesses can show up any place on our body.

The most common sites are axilla, gluteal region, groin areas, around anus and vagina (i.e. Bartholin gland abscess), the base of spine (pilonidal abscess) and around a tooth (dental abscess). Inflammation around a hair follicle can also lead to the formation of an abscess, which is called a boil (furuncle).

People with weakened immune systems, [chronic steroid therapy, chemotherapy, diabetes, cancer, AIDS, sickle cell disease, leukemia, peripheral vascular disorders, crohn's disease, ulcerative colitis, severe burns, severe trauma and alcoholism or IV drug abuse], get certain abscesses more often and more severe. This is because the body has a decreased ability to ward off infections. Unlike other infections, antibiotics alone will not usually

cure an abscess. In general an abscess must open and drain in order for it to

improve. Sometimes draining occurs on its own, but generally it must be opened by a doctor especially surgeon, in a procedure called incision and drainage (I&D). A total of 1065 cases were studied in our study, which probably represent an underestimation, as may reflect difficulties in accessing health care for functional, geographic, socioeconomic and cultural reasons.

Most of serious skin infections were preceded by an identified or unidentified skin injury. This could be related to the warmer climate. Increased environmental air temperature has been linked to higher frequencies of insect bites and subsequent rises in impetigo incidence. In addition, increased skin exposure due to individual, socioeconomic and climatic factors may raise the rate of both insect bites and other minor skin injuries [11].

As diagnosis of soft tissue abscess was primarily based on clinical signs and symptoms, with infrequent need for any investigations beyond basic hematology, biochemistry and microbiological testing. These tests were necessary for diagnosis of associated medical illness.

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In our study prevalence of acute abscesses was more in patients under 40 years of age (80%) and male patients were more than females (63.57% Vs 36.43%). This may be because, in our culture males are the working members and females are usually housewife; moreover majority of laborers, field workers and farmers were males and they were more prone for trauma and insect bite. On the other hand, males are also given preference over females, in utilization of health services. Other studies, Stewart et al (1985) also favor male predominance with male: female ratio 2:1 [11].

Incidence of acute abscesses was more common in lower socio-economic group (81.78%). It is mainly due to their poor living standard, poor personal hygiene, poor nutritional status, illiteracy and ignorance regarding various aspects of illness as well as its treatment.

The lower limb is the most commonly affected sites (33.24%) in our study. Other authors also have reported a predominance of lower limb [12,13,22]. Reason for this is likely to be a result of frequent minor trauma to the legs. Old age diseases like atherosclerosis and Buerger's disease may also predispose to lower limb abscesses after minor injuries.

In the current study predisposing factor for abscess formation was found in 218 patients (20.47%). Out of these 78 (7.32%) patients had abscess following intramuscular injection, 140 (13.15%) after blunt trauma. Injection abscesses were more common in gluteal region compare to arm region (79.49% Vs 20.51%). The high association of gluteal abscesses with intramuscular injections indicates that aseptic techniques were probably not followed by unqualified and even qualified health care professionals.

Intramuscular injection even with the use of disposable syringe can lead to abscess formation [7, 8] and the mechanism of infection has been reported as tissue damage followed by endogenous (hematogenous) infection. Exogenous infection can also occur in penetrating trauma.

Use of improper drug at improper sites, without taking due precautions by medical and paramedical persons at all level of health care system, has increased the post injection abscesses. These injection abscesses were converted into a large deep seated abscess in patients who received massage and hot fomentation after intramuscular injection to get relief pain. Maqbool S et al (1999) and many other authors also reports trauma as a cause of abscesses in 25% patient [4,5,6].

In our study majority of patients were illiterate, poor and residing far away from health centers. They waited for the abscesses to ripen (i.e., when skin became yellow) and only after that they came for the treatment. Most of the patients received different type of premedication in the form of hot fomentation, local application of various types of leaves and poultices of methi dana, lime, turmeric, honey, tulsi alone or in combination with different oils eg-noorani tel, bijli ka tel, mustard oil with or without massage, before they seek medical advice.

All these intervention caused various changes like dark skin pigmentation, excoriation, thinned black skin leading to poor healing and bad cosmetic. Massage therapy over abscess and infected area should be avoided, as massage could spread the infection [23].

Most complementary medical interventions, including massage therapy, are dangerous until all signs of a cellulitis infection have dissipated. Massage is contraindicated in the treatment of patients with malignancy, acute inflammation or closed abscesses, and those who are in the third trimester of pregnancy. Effect of use of these home remedies is not available in medical literature. We need a dedicated study to see effect of these home remedies.

Lab investigations were done in limited patients because of economic limitations and un-willingness by the patients. Anemia is a known to be a predisposing factor that lowers resistance to infection [3]. This was confirmed by the presented data of 65.38% of patients having moderate to severe anemia. In the current study, culture was done in 200 randomly selected patients and reports were positive in 55.55% cases while in 44.45% no organism was cultured.

This high rate of culture negative may be because many of these patients were already on antibiotic therapy before coming to us. The organism most commonly involved were *Staphylococcus aureus* and *Klebsiella aeruginosa* in 72% and 11% cases respectively. These finding are supported by other studies which identified *S. aureus* as being the major organism in cutaneous abscesses [9,14,15,19].

All these organisms showed predictable sensitivity to standard antibiotics such as ceftriaxone, amikacin, cefuroxime, gentamicin and clarithromycin and metronidazole for anaerobes. A significant number of patients had been started postoperative antibiotics. Incision and drainage of abscesses is usually adequate treatment.

Majority of patients (61.51%) have shown good result, symptoms subside within 5 days and discharge within 7 days of admission. In 28.95% symptoms relieved within two weeks and required admission ≥ 2 weeks of admission. Few patients have poor response, symptoms persist for ≥ 2 weeks, required re-drain and only discharge after 3 weeks.

Poor responders usually had underlying pre-existing disorders like severe anemia, uncontrolled diabetes, chronic malnutrition etc. Mortality is rare and usually due to an underlying disease condition, HIV and neglect.

Controversy exists about the use of antibiotic therapy following incision and drainage of cutaneous abscess. Few studies conclude that antibiotics did not alter the outcome of superficial Abscess [10]. They also advise that routine culture and antibiotic therapy were not indicated for localized abscesses in patients with normal host defenses. On the other hands some studies advocate that parenteral antibiotic treatment diminished the rate of bacteremia, when used before draining subcutaneous abscess.

In developing countries like India, where anemia and malnutrition are very common, unhygienic condition and poor health facilities, it seemed more prudent to give antibiotic. Appropriate antibiotic therapy is the key to infection treatment. Empirical therapy should depend on several factors, like potential pathogens, disease severity, clinical complications and the instrument of entry (eg, animal bite). For all uncomplicated lesions, empirical therapy should target the typical Gram-positive skin flora, such as *Staphylococcus aureus* [17,18,20].

Conclusion

Abscesses and other soft tissue infections represent a significant burden on health care system. There is a high frequency of soft tissue infections in developing countries like India. Many of these abscesses follow trauma including intra-muscular injections.

Use of different type of premedication in the form of hot fomentation, local application of various types of leaves and poultices and massage can increase complication. Improving living standard, early presentation and treatment can reduced the incidence, morbidity and mortality from acute abscesses in our environment. Education regarding proper use of sterilized needles by staff and technician and early initiation of adequate treatment of cellulitis should be done to prevent complications.

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