



Lymphangitis: A Descriptive Observational Case Study

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Abstract : Cellulitis is the microbial characterization of the skin by bacteria, mainly streptococci and staphylococcus aureus. This mainly affects the lower limbs of diabetic patients and is not communicable. The current study is on a 55 year old female from a poverty-stricken family admitted in the hospital with chief complaints of ulceration of foot, watery discharge, hollowing of skin, pus and wound discharges including a pungent smell, erosion of great toe (foot gangrene). The infected area was hollow, reddened, with warmth and was spreading rapidly to other areas of the foot. The wound was cleaned with hydrogen peroxide instead of normal saline and distilled water. The hydrogen peroxide indeed kills the neutrophils beneath the skin thus causing late healing of wound and increasing the virulence. The patient was primarily treated with antibiotics such as T.Metronidazole, Inj.Cefotaxime, T.Amoxicillin along with pain killers diclofenac, Paracetamol for antipyretic action. Vitamin supplements were also prescribed. Pharmacist can play an active role in reducing the incidents of complaints related to diabetes mellitus by non pharmacologic therapy and other instructions. Antibiotic culture of the pus would give an appropriate therapy to be done and avoids unnecessary complications in the future due to resistance.

Key Words : Staphylococcus aureus, cellulitis, ulceration, great toe.

Introduction:

Cellulitis is the inflammation of the skin and soft tissue caused due to bacterial infections commonly affecting the lower limbs, in a large proportion, with other regions including eye orbital, upper limbs etc^[1,2]. It is sometimes also called as Lymphangitis or Erysipelas, It is commonly found to be associated with edema of the foot, fever, malaise etc., Main causes of infections include access of the site by Streptococci, Staphylococcus aureus, and other microorganisms^[3]. Accurate diagnosis of the affected site is most of the time not exactly done thus leading to unwanted complications in future with recurrent attacks of cellulitis and antibiotic resistance associated with it. Severity due to Streptococcal infections may include, necrotizing fasciitis, streptococcal toxic shock syndrome, infected venous eczema, lymphoedema, myositis, deep vein thrombosis, fasciitis and tibial compartment syndrome^[4,5].

The major causes for the cellulitis include bacterial infection, chemical toxins associated with food, autoimmune reactions within the body, idiopathic, cuts, insect bites, and surgical incisions^[6]. If untreated for

Vedha Pal Jeyamani S et al /International Journal of ChemTech Research, 2018,11(08): 65-69.

DOI= <http://dx.doi.org/10.20902/IJCTR.2018.110807>

longer period of time, severe complications include, blood infection (sepsis), bone infection (osteomyelitis), inflammation of the lymph vessels (lymphangitis)^[7]. The foot cellulitis may be a healing or non-healing complication. Cellulitis can cause, local abscess formation, orbital cellulitis, intracranial extension of cellulitis, sinus thrombosis, septic embolic of optic nerve and optic nerve ischemia if untreated. The dietary supplements should be taken, as much to increase the immune resistance with antibiotics and steroids occasionally^[8,9].

Pharmacological therapy for mild cases of cellulitis may include treatment on an outpatient basis with dicloxacillin 500mg PO qid, amoxicillin 500mg PO tid, and cephalexin 500mg PO qid. Treatment may consist of 7-10 days. Clindamycin 300mg PO qid or a macrolide (clarithromycin or azithromycin) 500mg PO od, are reasonable alternatives in patients who are allergic to penicillin. As the severity increases other antibiotics include Vancomycin 1g IV bd, Daptomycin mg/kg IV, Linezolid 600mg PO bd, Penicillin 2-4 million units IV qid, Cefotaxime 1-2 g IV qid. Appropriate Non-Pharmacological therapy along with the antibiotics works out well with good results. The pathophysiology of cellulitis could be as follows^[10,11].

Access of microorganisms (foreign bodies) through discontinuities and cuts of skin.

↓
Inflammatory response

↓
Leads to redness, swelling, pain, warmth, erythema, itching (spread of infection is limited)

↓
Immune system fails to curb the initial infection – infection become systemic spreading to adjacent areas (bacteremia)

↓
Group A: Streptococcus and Staphylococcus are common causative agents of living in human skin – cause infection if skin is broken.

↓
Predisposing conditions for cellulitis include insect sites, animal bite, on pruritic skin rash, recent surgery, athlete's dry skin and eczema.

↓
Prompt treatment is very important to prevent serious complications. If deeper layers of the skin is infected, it may enter into blood stream or lymph nodes.

↓
Repeated cases of cellulitis may damage the lymphatic drainage system, and lead to chronic swelling of affected limb.

↓
If cellulitis spread to deeper layers of soft tissue (fascial lining) it may cause, necrotizing fasciitis.

↓
The commonly referred “flesh eating bacteria” necrotizing faciitis can progress rapidly and lead to death.

Case Study

A 55 year old female was admitted to the hospital with chief complaints oftenderness, warmth at the site of infection with deep penetrating through dermal layers of foot, reddening, rapid spreading of ulceration started from the great toe. The patient had a past medical history of Diabetes Mellitus for the past 15 years and was on therapy with Metformin 850mg, Glimepiride 1 mg. Her refilling of prescription was poor at times and regular monitoring of vitals was not properly done. The patient made use of OTC products in case of any pain of legs, backaches. She was married and belonged to a low socioeconomic class category. Her husband worked in farms where she too joined in order to run the family. She already had a past history of cellulitis which was initiated from an insect bite of sting which developed into ulceration very shortly within 2 weeks. It was treated with mild antibiotics on an Out-patient basis and was controlled. She was on menopause for the past 6 years from which her immune was not compromised and easily liable to pains, cold, fever etc., Her diet consisted of normal intake of caffeinated products and carbohydrates two times a day. On general examination the patient was conscious, oriented and afebrile. Her culture examination of the pus for cellulitis showed the presence of Staphylococcus aureus. There was sensitivity to Gentamicin, Nitrofurntoin and resistance to Amoxicillin + Clavulanic acid, Ciprofloxacin.

Table 1: Laboratorial investigation of the patient:

Diagnostic parameters	Patient values	Normal values	Inference
White Blood Cells	2890 mg/dl	4000-11000 mg/dl	Decreased
Red Blood Cells	3.35mill/cc	3.8-.4.8 mill/cc	Decreased
Hemoglobin	12.5g/dl	12-17 g/dl	Within limits
MCV	78.9 fl	76-96 fl	Within limits
MCH	28 pg	27-32 pg	Within limits
MCHC	33	31-35	Within limits
Platelets	4.66 lakhs/cumm	1.5-4 lakhs/cumm	Increased
Lymphocytes	6.7%	20-40%	Decreased
Monocytes	4.5%	2-10%	Within limits
Neutrophils	38%	40-80%	Decreased
Red Blood Sugar	210 mg/dl	80-140 mg/dl	Increased
Urea	18 mg/dl	7-18 mg/dl	Within limits
Creatinine	0.5 mg/dl	0.6-1.3 mg/dl	Decreased
Urine colour	Pale yellow	Pale	
Sugar	Nil	Nil	
Pus cells	10-15	Nil	
Epithelial cells	8-12	Nil	
ESR	16mm/hr	5-20mm/hr	Within limits
Temperature	99° F	98.4°F	Increased
Blood pressure	120/80 mm/hg	120/80 mm/hg	
Pulse rate	76/min	71-75/min	Within limits
Respiratory rate	22 breaths/min	12-20 breaths/min	Increased

Discussion

Cellulitis is defined as the inflammation of the subcutaneous skin layer due to bacterial infections, which inturn causes the erosion of the skin and soft tissues^[12, 13]. The patient in the present case already had a past history of cellulitis in one of her leg which as controlled with antibiotics. She still continued to work in the fields in her normal routine after her first episode of cellulitis. Most importantly hyperbaric oxygen therapy may be used. It is the natural healing of cellulitis, through the administration of oxygen^[14, 15].The further severity of the case was due to use of hydrogen peroxide as antiseptic in the patient, which further increased the virulence making it more intense. In such cases, normal saline or distilled water, or diluted form of hydrogen peroxide can be used. It kills the neutrophils beneath the skin and causes late healing. Pharmacological therapy consisted of treatment with T.Metronidazole 350mg qid, Inj.Cefotaxime 1g bd, T.Amoxicillin 500mg bd for antibiotic activity. T.Paracetamol 500mg qid was given for antipyretic activity,Diclofenac100mg bd, Vitamin B-Complex od, Multivitamin 5mg od, Ranitidine 40mg bd. The therapy was found to be satisfactory with improved prognosis of the patient.

Then on pharmacological measures insisted include the following;

- Good dietary intake of fruits, fresh greens, vegetables etc., was essential which helps in forming the patient as a good healthy individual.
- Good aerobic excise, physical exercise, rich vitamin and mineral intake may be sufficient.
- Decreased intake of caffeinated drinks, salted food products could be done.
- Increasing the intake of water to 1-2 liters which flushes the microbes and toxins out of the body.
- Low fat, low sugar, high fiber diet, with heaps of food, vegetables and whole grains.
- Exercise for 30 minutes daily improves muscle tone, increases circulation to trouble areas.
- Washing of wounds daily with soap and water as a part of normal bathing.
- Application of a protective cream or ointment like Neosporin, Polysporinetc provides adequate protection.
- Covering of wounds with bandage and changing of it on regular basis.
- Trimming of fingernails and toenails carefully in order to avoid injuring to surrounding skin.
- Wearing of appropriate footwear and gloves to limbs of more susceptibility.

- Moisturizing of skin regularly which helps prevent crackling and peeling.
- Antibiotic induced diarrhea may accompany sometimes where water soaks could be made use of.
- Administration of antacid and multivitamin is done before and after food respectively.



Figure 1: cellulitis affected at the back of great toe, foot and other regions, which is healing, of grade III ulceration.

Figure 2: Healed cellulitis in another limb, blackened with spores of patches.

Conclusion

The role of pharmacists in cellulitis management, including patient identification, assessment, education, referral, and monitoring at initial stages would be of more concern in patient care. Pharmacists can help identify patients with cellulitis through screening and should target patients at high risk, people with a family history of the disease. Patient education should be provided immediately after diagnosis, at a second stage at which time a patient assessment can be performed, and at a third stage during which patients can receive continuing education to reinforce concepts and a motivational boost. One of the pharmacist's most important roles is the referral of patients to other members of the diabetes care team. Pharmacist should play a vital role in reducing the morbidity and mortality of the particular disease.

Acknowledgment

The authors are thankful to Dr.C.Sekar, Chief Medical Superintendent, Government hospital, Thiruvallur for his constant support and encouragement throughout the study. We thank the patients who gave their willing consent for the publication of their case by sharing complete information needed for the study.

Compliance with Ethical Standards

Written informed consent was obtained from the patient for publication of the case study, inclusion of the accompanying images. Copies of written consent may be requested for review from the corresponding author.

Conflict of Interest

The authors declare no conflicts of interest concerning the content of this case report.

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