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Original Research Paper

Surgery

CELLULITIS :SPECTRUM OF THE DISEASE IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Cellulitis is a non suppurative, invasive infection of tissues, which is usually related to the point of injury. It is characterized by an expanding area of erythematous, edematous tissue that is painful in association with fever , malaise, leucocytosis.It is typically caused by organisms such as beta hemolytic streptococci, staphylococci and Clostridium perfringens. Approximately 2% of total surgery OPD visits are cellulitis patients.

Methods: Data was taken from October 2017 to September 2018 from the department of surgery and from the department of Microbiology, Assam Medical College. Data was analyzed with respect to age, sex, presentation, associated comorbidities, mode of onset, body site distribution, progression of disease, organism isolated from microbiological culture and their antibiotic sensitivity, adjuvant treatment provided, duration of hospital stay and outcome.

Results: Total 112 patients were included in the study. Chronic liver disease was associated with 36 cases, followed by obesity in 29 cases. Blood culture was positive in 4 cases. Most common organism isolated was klebsiella pneumonia (22 cases) and methicillin resistant staphylococcus aureus (15 cases). Most sensitive antibiotic for gram negative bacilli was tigecycline and colistin. Most sensitive antibiotic for gram positive cocci were linezolid, vancomycin and ofloxacin. Most common empirical antibiotic given was linezolid followed by piperacillin with tazobactum.

Discussion: Recent emergence of community acquired MRSA, along with gram negative organisms like klebsiella esp. ESBL(extended spectrum beta lactamase)+ve klebsiella pneumoniae sensitive to higher end antibiotic like colistin, tigecycline causes more concern. Antibiotic therapy is recommended depending upon local practice and resistance rate in consultation with medical microbiologist. Addressing of non-antibiotic factors such as limb elevation, wound dressing & of comorbidities should be considered as integrated part of clinical management of cellulitis.

KEYWORDS :

INTRODUCTION:

Cellulitis is a non-suppurative, invasive infection of tissues, which is usually related to the point of injury. It is characterized by an expanding area of erythematous, edematous tissue that is painful in association with fever ,malaise and leukocytosis[1].Chronic edema impairs local cell nutrition due to increased interstitial diffusion distance of oxygen and nutrients, so tissue viability is compromised[2].Typically caused by -hemolytic streptococci, staphylococci and Cl. perfringens[1].Tissue destruction, gangrene and ulceration may follow due to release of proteases[1].Systemic events (chills, fever, rigors) follow the release of toxins into circulation, which stimulate a cytokine mediated inflammatory response even though blood culture may be negative[1]. Skin breaks ,lymphoedema, venous insufficiency ,Tinea pedis ,obesity ,immune dysfunction are commonly associated risk factors[3].Haemoglobin%,CBC(complete blood count), ESR(erythrocyte sedimentation rate) ,CRP(C reactive protein) ,RBS(Random blood sugar) ,LFT(liver function test), Serum Na^+, K^+, blood urea, creatinine are routine diagnostic tests[4]. Imaging studies like plain x-ray films are used to diagnose underlying osteomyelitis, ultrasound can suggest underlying abscess, duplex ultrasound can diagnose deep vein thrombosis, sometimes MRI is used for diagnosis of necrotizing soft tissue infection, osteomyelitis. Microbiological Culture[5] has an important role in choice of antibiotic . Culture from wound swabs has high yield. Blood cultures has low yield, usually positive in less than 10% of cases. Approximately 30% of cellulitis patients are misdiagnosed. Commonly encountered alternate diagnosis include eczema, lymphedema & lipodermatosclerosis.Of misdiagnosed patients 92% received unnecessary antibiotic, 85% did not require hospital admissions.

Cellulitis is one of the frequently encountered condition, but remains a challenging entity .Under treatment and overtreatment with antimicrobials frequently occurs. Some of the frequently occurring skin and soft tissue disease cloud the diagnosis. About 2% of OPD cases are related soft tissue infections.The study attempts to observe typical clinical presentation, mode of onset, associated co morbid condition, micro organism isolated along with their antibiotic sensitivity, and management approaches.

METHODOLOGY

The study was conducted in a prospective manner by collecting data from the patients interview ,inpatient record, for 1 year (Oct 2017 – Sept 2018), in the department of Surgery Assam Medical College and Hospital. All Patients admitted to the department of surgery with the diagnosis of cellulitis were included. Patients below 12 year of age, diabetic foot patients, patients having surgical wound were excluded from the study. Patients were followed up for 4 weeks after discharge from hospital.

RESULTS:

A total of 112 patients have been admitted (male 85,female 27) to the department of general surgery who were treated for cellulitis. Average age of the patients was 56 years. Most common presenting feature was soft tissue swelling and pain in the affected area(100%),followed by fever(83%), erythema (75%),bullae ,raw area(60%).3 cases presented with shock(2.6%) which could not be revived.17 cases(15.17%) had history of recurrent cellulitis.

Chronic liver disease was found to be associated with 36(32.14 %) number of cases ,followed by obesity in 29 cases(26%). Other comorbid conditions found to have associated with cellulitis patient were diabetes mellitus(16%), Cardio vascular diseases(10.71%), nephropathy(6.25%), carcinoma(1.7%), tuberculosis(2%).

Most of the cases had traumatic(103 cases,92%)mode of onset which are as follows-Injury by abrasion, nail, thorns,

etc.(long neglected wound)45 cases, blunt trauma 10 cases, post-operative case of varicose vein stripping and Ligation 3 cases, fissured toe webs 12 cases, gynecological operations (radical Hysterectomy and vulvectomy) 9cases(all are lower limb cellulitis), post MRM(modified radical mastectomy) 8 cases(all are upper limb cellulitis), venesection site related 6 cases ,insulin syringe site 5 cases(all are abdominal wall cellulitis) ,central line catheter related in ICU 3 cases ,snake bite 2 cases.

As per body site distribution most of the cases were lower limb cellulitis comprising of 76 no of cases out 112, followed by upper limb cellulitis in 26 cases, abdominal wall cellulitis 5 cases and head & neck cellulitis 3 cases

101 (89%)cases were anemic (hemoglobin level<10g/dl) out of which 18 cases (16%) were having hemoglobin below 7g/dl at the time of admission.96 cases (85%) had albumin level <3g/dl (normal 3.5-5.5 g/dl).

In blood culture reports out of 24 blood cultures 4 showed positive,2 cases of streptococcus pyogenes,1case of methicillin resistant staph. aureus sensitive to vancomycin,1 case of Extended spectrum beta lactamase positive klebsiella pneumoniae sensitive to aztreonam.

In the study wound swab culture was done for 101 cases. Overall klebsiella pneumoniae was most common organism, followed by staphylococcus and streptococci. There was also emergence of ESBL +ve klebsiella pneumoniae, MRSA had been reported. In 28 cases culture showed no significant growth.

In the treatment the most commonly used antibiotics were broad spectrum. Linezolid was used in highest number of cases, followed by piperacillin tazobactum, ceftriaxone sulbactum. These antibiotic were used due to availability in govt supply and most patient could not effort to buy antibiotic due to economic constrains.

As per antibiogram obtained from the department of microbiology following are the most sensitive antibiotic for gram negative bacilli with their % sensitivity-colistin (95.5%) tigecycline(96%), meropenem(85.7%), aztreonam (54.5%), imipenem(78%), levofloxacin(60%).The most sensitive antibiotic for gram positive cocci are vancomycin(100%), linezolid(100%),ofloxacin(100%),levofloxacilin(90%).None of these antibiogram showed piperacillin tazobactum as sensitive.

Presenting complaints	Nos	Percentage	Mean duration[days]
Soft tissue swelling	112	100	7.4
Erythema	84	75	6.2
Pain	112	100	5.7
Fever	95	83	2.2
Shock	03	2.6	---
Bullae/raw area	68	60	4.7

Presenting complaints

In the study, out of 112 patient 101 patient were treated with limb elevation which comprises of upper and lower limb cellulitis patient. Dressing and debridement was done in 101 cases where ulcer or raw area developed.4 patient required plastic surgery for skin grafting.1 patient required amputation.3 patients expired during hospital stay.

It was also observed that 12 patient received anti-hypertensive,7 patient received nephroprotective drug, insulin was started with 18 cases of diabetes .32 patients received blood transfusion.68 patients received high protein diet/albumin infusion.3 patient underwent dialysis for nephropathy.In 2 patients ATT was started for tuberculosis.

Maximum patient 48(42.85%)numbers had hospital stay more than 2weeks,42 patients had hospital stay of 7-14 days and 22 patient left hospital before 7 days.

During follow –up 80 patients who were in healing state came for follow up after 2 week,by this time 12 patient got full recovery,17 patient did not come for follow up.72 patient showed up after 4 weeks of discharge, got complete recovery. But 37 patients lost follow up.

DISCUSSION:

In a study done by Julio Collazoz et al.[7], it was found that mean age of cellulitis patient was 63.3 years and 51.8% were male. In our study the mean age was 56 years and 75% were male.

In the study by Tianyi FL et al.[8] , local risk factors of cellulitis were found to be disruption of skin barrier, neglected wound, toe web impetigo, leg ulcer and leg edema. Obesity was the only systemic risk factor in that study. In our study, similar local risk factors were observed. Along with obesity, chronic liver disease, anemia, hypoalbuminemia (poor nutritional status) were also observed in many patients.

In a study done by Ginsberg MB[4], it was found that cellulitis most commonly involved the lower extremity but may involve upper extremity, trunk, perineum and head. In this study we found a similar involvement.

In a study done by Lee CY et al[9], it was found that β-hemolytic streptococci was the most frequent cause, followed by streptococcus. In our study we found the predominance of klebsiella pneumoniae, followed by MRSA(methicillin resistant streptococcus aureus).

In a study by Julio Collazoz et al[7], poor treatment response was observed with previous episode of cellulitis, non-surgical trauma, lymphedema, immunosuppression and lower limb involvement. In our study similar observations were made.In the same study it was also found that treatment response was not associated with the causative micro organism, the number of antimicrobial used or its duration. Penicillin was most frequently used. In our study also though piperacillin Tazobactum was 2nd most commonly used antibiotic, but neither of the antibiogram shows sensitivity. Yet the patients recovered.

In the study by Brunn et al[10], it was found that early antimicrobial escalation (first 3 days) did not result in improved outcomes and addressing non antibiotic factors such as limb elevation & treatment of co morbidities should be considered as an integrated part of the clinical management of cellulitis. In our study also we observed correction of anemia, albumin level, glycemic control, antihypertensive medications along with limb elevation & dressing and debridement of wound resulted in enhanced recovery of the patients

CONCLUSION

Cellulitis is one of the commonly encountered entity in our health care facility ,which is associated with great amount of morbidity to patients .For most patients in our study duration of hospital stay was more than 2 week, which leads to loss of income and economic strains to the family members as most of them were daily wage earner.Health awareness is needed for early intervention which prevents significant morbidity. Predisposing risk factors like limb edema, tinea pedis,any minor trauma should be evaluated and measures should be taken to address them. Adequate treatment of the co-morbidities like diabetes, obesity,cardiovascular diseases should be done. Nutritional supplement, limb elevation, skin hygiene, proper dressing of raw area improved the outcome. Establishment of antibiotic policy based on local practice,

resistance rates in consultation with medical microbiologist is essential for prevention of antibiotic resistance.

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