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Research Article

NECTROTIZING SOFT TISSUE INFECTION OF BREASTS: A STUDY OF CLINICAL PROFILE

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ABSTRACT

Objective: In this study, we aim to study the clinical profile of patients with necrotizing fasciitis of the breast and identify potential risk factors.

Methods: It is a retrospective observational study. Case records, from January 2017 to December 2023, were observed for age, gender, occupation, socioeconomic status, body mass index (BMI) clinical features, and radiological findings (size, site, status, involvement of tissue compartments, and bone). A total of 22 patient records were evaluated.

Results: We evaluated 22 patients and observed that all the patients were females, 54.5% of patients were in the 18–40 years age group. 59.1% of patients had BMI of more than 30 kg/m^2. Pain and fever were the most common clinical presentations followed by local discharge. 90.9% of patients had leucocytosis and 81.8% were anemic. Raised bilirubin levels, raised international standardized ratio, and low albumin levels were found in more than 60% of cases. Diabetes mellitus was the most commonly associated co-morbidity seen in 63.6% of cases. We observed a total mortality of 18.1%.

Conclusion: Necrotizing fasciitis of the breast is a rare disease. Outcomes may be poor in the form of extensive local mutilation, loss of breast tissue, and even mortality. An early and adequate management response is warranted.

Keywords: Necrotizing soft tissue infection, Breast, Debridement, Antibiotics.

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INTRODUCTION

Necrotizing soft tissue infection (NSTI) is an uncommon, potentially fatal, and most aggressive form of soft-tissue infectious disease [1]. The disease spectrum varies from mild soft tissue infections to severe forms manifesting as septic shock and multi-organ dysfunction syndrome [2,3].

NSTI of the breast can be idiopathic or occurs secondary to a causal agent [3]. It is commonly observed in diabetic or immune-depleted hosts, but it has also been reported in healthy patients [4]. It is associated with mortality rates ranging from 10% to 73%, with lower rates associated with timely and adequate management [4,5].

The state can infrequently be seen after surgical interventions, such as mastectomy and cosmetic procedures and can progress rapidly to fatal end results [6]. Treatment often requires the use of several modes, such as debridement, triangulation, vacuum-assisted closure dressing, and skin grafting [6]. Immunocompromise, injuries, lactation, and diabetes mellitus are well-documented risk factors and the incidence of disease in the absence of these is very infrequent [7,8].

In this study, we aim to study the clinical profile of patients with necrotizing fasciitis of the breast and identify potential risk factors.

METHODS

It is a retrospective observational study conducted in our surgical unit of a tertiary care Centre, Guru Gobind Singh Medical College and Hospital, Faridkot, India with ethical compliance. Case records, from January 2017 to December 2023, were observed for age, gender, occupation, socioeconomic status, body mass index (BMI) clinical features, and radiological findings (size, site, status, involvement of tissue compartments, and bone). A total of 22 patient records were evaluated. The demographic characteristics include age, sex, and socioeconomic status. Nonclinical risk factors include parity, obesity, nutritional status, substance abuse, and use of immuno-suppressor drugs and steroids. The use of a vegetarian diet and a non-vegetarian diet was included in dietary habits. The clinical profile included performance status, presenting symptoms, duration of symptoms, presence of anemia, number, and site of disease, and features of sepsis, deranged laboratory parameters. The interview technique was used to collect information about demographic characteristics, nonclinical characteristics, and dietary habits. A questionnaire developed specially for the study was used for the interview through telephonic conversation. Socioeconomic status was determined as per the modified Kuppuswamy's socioeconomic scale 2021. Documentation of clinical features was done by history, physical examination, and imaging features. All consenting adult patients who could be contacted and consented to be part of the study were included and patients with ages below 18 years, non-consenting individuals, and patients on who left the hospital against medical advice were excluded. All patients were managed according to the local protocol for the treatment of NSTIs and intensive care support. In our institute, cases of severe NSTIs mandate treatment with beta-lactams and beta-lactamase inhibitors (e.g., piperacillin, tazobactam) or carbapenems (e.g., meropenem) along with clindamycin as empirical antibiotic therapy and immediate surgical consultations for debridement. The antibiotics were further adjusted according to disease progression and availability of antibiotic sensitivity reports. Descriptive variables were represented using mean for continuous data and frequency (%) for categorized data.

RESULTS

We evaluated 22 patients and observed that all the patients were females, 54.5% of patients were in the 18–40 years age group and 100% had unilateral disease. 72.7% of patients were in the lower socio-economic group. 59.1% of patients had BMI of more than 30 kg/m^2. 36.4% of cases had a positive history of substance abuse. Pain and fever were the most common clinical presentations followed by local discharge (Figure 1). 90.9% of patients had leucocytosis and 81.8% were anemic. Raised bilirubin levels, raised international standardized

Fig. 1: Necrotizing soft-tissue infection breast

Table 1: Clinical profile of patients with necrotizing soft-tissue infection breast

Attribute	Frequency, n (%)
Age (years)	
<18	Nil
18–30	8 (36.36)
31–40	4 (18.18)
41–50	4 (18.18)
51–60	2 (9.1)
>60	4 (18.18)
Gender	
Male	Nil
Female	22 (100)
Residence	
Urban	16 (72.7)
Rural	6 (27.3)
Socioeconomic status	
Upper	Nil
Middle	6 (27.3)
Lower	16 (72.7)
Admission	
Elective	Nil
Emergency	22 (100)
BMI (kg/m^2)	
<30	9 (40.9)
>30	13 (59.1)
Alcohol	6 (27.3)
Intravenous drug abuse	2 (9.1)
Immunosuppressant drugs	4 (18.18)
Clinical features	
Fever	18 (81.8)
Pain	20 (90.9)
Local signs of inflammation	22 (100)
Loss of consciousness	2 (9.1)
Discharge/foul smell	19 (86.4)
Sepsis or multi-organ dysfunction syndrome	5 (22.7)
Anatomical site	
Breast	
Unilateral	22 (100)
Bilateral	Nil
Laboratory parameters	
Hemoglobin (g/dL)	
<10	18 (81.8)
>10	4 (18.2)
Leucocytosis (cells >11000/mm^3)	20 (90.9)
Liver function tests	
Raised bilirubin (>17 µmol/L)	14 (63.6)
Raised transferase enzymes (>60 units /L)	8 (36.6)
Raised alkaline phosphates (>150 units/L)	4 (18.2)
Low serum albumin (<35 g/L)	14
Renal function tests	
Blood urea >20 mg/dL	14 (63.6)
Serum creatinine >1.5 mg/dL	10 (45.5)
International normalized ratio>1	13 (59.0)
C reactive proteins> 4 mg/dL	14 (63.6)
Acidosis on presentation	14 (63.6)
Ionotropic support on presentation	2 (9.1)
Ventilator requirement on presentation	2 (9.1)
Admission to debridement surgery	
Same day	14 (63.6)
Delay >1 day	8 (36.6)
Mean Hospital stay till discharge or reconstructive surgery in days	9 (40.9)
Comorbidities	
Diabetes mellitus	14 (63.6)
Hypertension	12 (54.5)
Respiratory disorders	7 (31.8)
Human immunodeficiency virus-positive status	1 (4.5)
Others like malignancy, connective tissue disorders, and coronary artery disease	6 (27.7)
Microbiology	
Gram–positive	8 (36.4)
Gram–negative	12 (54.5)
Polymicrobial	2 (9.1)
Total	2 (9.1)
Mortality	
<24 h	1 (4.5)
<48 h	1 (4.5)
<7 days	Nil
>7 days	Nil
Requirement for multiple surgeries	10 (45.5)

BMI: Body mass index

ratio, and low albumin levels were found in more than 60% of cases. Diabetes mellitus was the most commonly associated comorbidity seen in 63.6% of cases. The predominant bacteria isolated were aerobic Gram-negative strains contributing to 54.5% of cases. We observed a total mortality of 18.1% (Table 1).

DISCUSSION

Necrotizing infection of the breast is a rare clinical condition and is commonly misinterpreted as breast abscess or malignancy that is commoner in occurrence [8]. Clinical features comprise redness, swelling, pain inconsistent with clinical findings, gangrene, blisters, and crepitus due to local gas formation [9]. There is a scarcity of case series or a clinical study of NSTI breast cases and most of the data available are in the form of case studies. Yaji *et al*. and Ward *et al*. in their respective reports highlighted the association of the condition with diabetes mellitus, this association in our studies was observed in 63.6% of cases [5,10]. Fayman *et al*. noted obesity and polycystic ovarian syndrome as the other associated morbidities. We observed obesity in 59.1% of cases. [11] Cai *et al*. in their review observed 81.5% unilaterality of the disease whereas 100% of our cases had unilateral disease [9]. Misiakos *et al*. also noted the association of the disease with age more than 60 years, alcoholism, obesity, diabetes mellitus, malnutrition, hypertension, and immunodeficiency conditions such as acquired immunodeficiency syndrome [12]. 54.5% of our cases had hypertension and 4.5% had HIV-positive status, though 54.5% of our cases were within the age bracket of 18–40 years. This may be explained by the trend of associated comorbidities manifesting at an earlier age. Authors have observed low hemoglobin levels, raised leucocyte counts, deranged liver, and renal function tests [13,14]. Our laboratory findings are consistent with the reported trend. 63.6% of our cases had hypoalbuminemia. This is in coherence with the general trend observed in general necrotizing soft tissue infections [15].

This rare disease carries a high potential for delayed diagnosis, prolonged hospitalization, and staged surgeries including debridement followed by reconstruction and mortality. There is a lack of data in the form of published literature.

CONCLUSION

Necrotizing fasciitis of the breast is a rare disease. The condition carries the potential for misdiagnosis of an abscess or malignancy often resulting in delayed or inadequate treatment. Outcomes may be poor in the form of extensive local mutilation, loss of breast tissue, and even mortality. Hence, an early and adequate management response is warranted. We also call for broader and more extensive studies to evaluate more risk factors and to plan for preventive strategies.

AUTHORS' CONTRIBUTIONS

Conceptualization: Dr. Kapil Rampal, Dr. Jyoti Yadav, Dr. Harkanwalpreet Kaur, Dr. Sudhir Khichy. Methodology: Dr. Kapil Rampal, Dr. Jyoti Yadav, Dr. Harkanwalpreet Kaur, Dr. Sudhir Khichy. Formal Analysis: Data collection, Writing–Original Draft Preparation: Dr. Kapil Rampal, Dr. Jyoti Yadav, Dr. Harkanwalpreet Kaur, Dr. Sudhir Khichy. Final Review: Dr. Harkanwalpreet Kaur, Dr. Sudhir Khichy.

CONFLICTS OF INTEREST

Nil.

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REFERENCES

1. Islam S, Aziz I, Shah J, Naraynsingh V, Harnarayan P. Necrotizing fasciitis of the breast requiring a life-saving mastectomy: A case report and literature review. Cureus. 2021 Nov 25;13(11):e19886. doi: 10.7759/cureus.19886, PMID: 34966604
2. Keune JD, Melby S, Kirby JP, Aft RL. Shared management of a rare necrotizing soft tissue infection of the breast. Breast J. 2009;15(3):321-3. doi: 10.1111/j.1524-4741.2009.00731.x, PMID: 19645797
3. Delotte J, Karimdjee BS, Cua E, Pop D, Bernard JL, Bongain A, *et al*. Gas Gangrene of the breast: Management of a potential life-threatening infection. Arch Gynecol Obstet. 2009;279(1):79-81. doi: 10.1007/s00404-008-0642-3, PMID: 18401589
4. Subramanian A, Thomas G, Lawn A, Jackson P, Layer G. Necrotising soft tissue infection following mastectomy. J Surg Case Rep. 2010 Mar 1;2010(1):4. doi: 10.1093/jscr/2010.1.4, PMID: 24945507
5. Ward ND, Harris JW, Sloan DA. Necrotizing fasciitis of the breast requiring emergent radical mastectomy. Breast J. 2017 Jan;23(1):95-9. doi: 10.1111/tbj.12686, PMID: 27633708
6. Gupta A, Gupta A, Ravi B, Mundra M, Sandhu H, Agrawal S, *et al*. Post-traumatic necrotising fasciitis of the breast: A case study with literature review. J Wound Care. 2019 Nov 2;28(11):775-8. doi: 10.12968/jowc.2019.28.11.775, PMID: 31721667
7. Konik RD, Huang GS. Management of primary necrotizing fasciitis of the breast: A systematic review. Plast Surg (Oakv). 2020 Nov;28(4):215-21. doi: 10.1177/2292550320928557, PMID: 33215036
8. Cai Y, Cai Y, Shi W, Feng Q, Zhu L. Necrotizing fasciitis of the breast: A review of the literature. Surg Infect (Larchmt). 2021 May;22(4):363-73. doi: 10.1089/sur.2020.071, PMID: 33026953
9. Konik RD, Cash AD, Huang GS. Necrotizing fasciitis of the breast managed by partial mastectomy and local tissue rearrangement. Case Reports Plast Surg Hand Surg. 2017 Aug 17;4(1):77-80. doi: 10.1080/23320885.2017.1364970, PMID: 28971110
10. Yaji P, Bhat B, Harish EE. Primary necrotising fasciitis of the breast: Case report and brief review of literature. J Clin Diagn Res. 2014;8(7):ND01-2. doi: 10.7860/JCDR/2014/9281.4558, PMID: 25177600
11. Fayman K, Wang K, Curran R. A case report of primary necrotising fasciitis of the breast: A rare but deadly entity requiring rapid surgical management. Int J Surg Case Rep. 2017;31:221-4. doi: 10.1016/j.ijscr.2017.01.049, PMID: 28189984
12. Misiakos EP, Bagias G, Patapis P, Sotiropoulos D, Kanavidis P, Machairas A. Current concepts in the management of necrotizing fasciitis. Front Surg. 2014 Sep 29;1:36. doi: 10.3389/fsurg.2014.00036, PMID: 25593960
13. Mufty H, Smeets A, Christiaens MR. An atypical case of necrotizing fasciitis of the breast. Acta Chir Belg. 2014;114(3):215-8. doi: 10.1080/00015458.2014.11681013, PMID: 25102715
14. Lee JH, Lim YS, Kim NG, Lee KS, Kim JS. Primary necrotizing fasciitis of the breast in an untreated patient with diabetes. Arch Plast Surg. 2016 Nov;43(6):613-4. doi: 10.5999/aps.2016.43.6.613, PMID: 27896201
15. Kumar T, Kaushik R, Singh S, Sharma R, Attri A. Determinants of mortality in necrotizing soft tissue infections. Hell Cheirourgike. 2020;92(5):159-64. doi: 10.1007/s13126-020-0568-1, PMID: 33776076