Case series of necrotizing fasciitis due to Candida tropicalis and review of fungal necrotizing fasciitis from India

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ABSTRACT

Necrotizing fasciitis (NF) comprise a spectrum of disease entities that are characterized by extensive, rapidly progressive soft-tissue necrosis and is associated with a high mortality. Here we report a case series of 3 patients diagnosed as mono microbial NF. All the isolates were Candida tropicalis and all were sensitive to amphotericin B, voriconazole and caspofungin and resistant to fluconazole. They all were isolated from the tissue sample as per standard mycological techniques. Despite timely diagnosis and treatment with amphotericin B one patient died.

Key words: Candida tropicalis, necrotizing fasciitis, review of literature.

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INTRODUCTION

Necrotizing soft-tissue infections (NSTIs) accounts a spectrum of diseases that are characterized by extensive, rapidly progressive soft-tissue necrosis, usually involves the muscular fascia and subcutaneous tissue. It can also affect the skin and muscle. Risk factors included are use of drug injection, obesity, and diabetes mellitus.1 These infections can have either a fulminant or simple presentation.2 Necrotizing fasciitis (NF) is associated with a high mortality (60%). 3 Here we report a case series of mono microbial NF due to Candida tropicalis in immunocompromised patients.

METHODS

From the NF cases tissue biopsy samples were collected. The samples were processed by standard mycological procedure for microscopy and culture. Candida isolates were identified by cultural characteristics, germ tube production, chlamydospore formation on corn meal agar, hichrome agar, and carbon and nitrogen assimilation test. Antifungal susceptibility of the isolates was done by broth micro dilution to amphotericin B (AMB), fluconazole, voriconazole and caspofungin as per the standard CLSI guideline, 2012. 4

CASE REPORT

Case 1

A 30 year old female presented to surgical outpatient department (OPD) with chief complaints of fever and swelling on the right gluteal region for 6 days. She gave history of medical termination of pregnancy (MTP) at 18 weeks and multiple injections in both buttocks 3 days back in a private hospital. She had high grade fever (104°F). Local examination of the right gluteal region revealed injection abscess showing petechiae and bruises, firm hard indurations which were warm, wide spread with ill defined margin of size 20×102 (Figure 1). The laboratory investigation were: hemoglobin (Hb) 6.5mg/dl, total leucocyte count (TLC) 13,200/cumm, platelet count 1,46,000/cumm, blood urea 134µg/dl, serum creatinine 0.4 µg/dl, blood sugar 240mg/dl and serum electrolyte i.e. Na+ 140mM/l and K+ was 2.1mM/l. On day 1, her tissue biopsy was send to the Microbiology for bacteriological and mycological culture and sensitivity. The bacterial culture was sterile. The sample was processed by standard mycological procedure for microscopy and culture. Candida isolates were identified by cultural characteristics, germ tube production, chlamydospore formation on corn meal agar, Hi chrome agar, and carbon and nitrogen assimilation test. Antifungal susceptibility of the isolates was done by broth micro dilution for Amphotericin B (AMB), Fluconazole, Voriconazole and Caspofungin as per the standard CLSI guideline, 2012. [4] The fungal culture revealed growth of yeast which was confirmed as Candida tropicalis resistant to Fluconazole and sensitive to Amphotericin B (AMB), Voriconazole and Caspofungin. AMB was started at the dose of 1mg/kg body weight for 28 days. On day 6; her repeat tissue sample for fungal and bacterial culture was performed and found to be sterile. The patient leaved against medical advice (LAMA) on day 10.

Figure 1(Case 1): Right gluteal region abscess after injection

Case 2

A 25 year old female presented to surgical OPD with a chief complains of pain, swelling for 4 days on the right gluteal region. She was pregnant for 3 month duration and gave a history of injection on the right gluteal region at her village by a local practitioner, after which she developed pain and swelling on that area. On local examination the injection abscess was 10×10 cm2 in size, edematous with raised local temperature. On laboratory examination: Hb was 6.7mg/dl, TLC 7600/cumm, blood urea 46 µg/dl, serum creatinine 0.5 µg/dl, blood sugar fasting 128mg/dl, Na+ level 130mM/l, K+ 3mM/l, BP was 100/60mm Hg. One day 1, her

tissue biopsy was send to microbiology department and on the basis of aforementioned method it was identified as Candida tropicalis. On antifungal susceptibility test it was resistant to Fluconazole and sensitive to AMB, Voriconazole and Caspofungin. The patient was also started with AMB at the aforementioned dose for 4 weeks but this patient also gone for LAMA on day 3.

Case 3

A 56 year old male was presented to surgical OPD with large lesion over the anterior abdominal wall then he was admitted to intensive care unit (ICU) with symptoms of fever, altered sensorium and swelling over anterior abdominal wall (Figure 2). Patient's attendant gave the history of thorn prick on his abdomen during his work, after which he developed swelling, indurations and high fever. He was started with antibiotic locally but he did not respond and gradually developed wound which was growing in size up to 60×50 cm2. All his parameters were deranged like Hb (4mg/dl), TLC (20,000/cumm), blood urea (176µg/dl), serum creatinin (5 µg/dl), blood sugar (120), Na+ level (230mM/l), K+ was (13mM/l) and BP was 80/60mm Hg. On the basis of above mentioned method it was identified as Candida tropicalis. On antifungal susceptibility test it was resistant to fluconazole and sensitive to AMB, voriconazole and caspofungin. AMB was started followed by debridement of the necrotic tissue, but the patient died after 5th day of treatment.

Figure 2 (Case 3): Anterior abdominal wall lesion after thorn prick

RESULT

A total of 3 patients of NF were seen. All the isolates were Candida tropicalis. The antifungal susceptibility testing by micro broth dilution method revealed that all the three isolates were resistant to fluconazole and sensitive to AMB, voriconazole and caspofungin. The clinic-demographical profile of patients is depicted in Table I.

	Case 1	**Case 2**	**Case 3**
Age	**30 y**	**25 y**	**56 y**
Sex	Female	Female	Female
Site	Right gluteal	Right gluteal	Anterior abdominal
	Region	Region	Wall
Predisposing factor	Multiple injections	Injection on	Thorn prick
	MTP, DM	gluteal region	abdominal wall
Size of lesion	20×10cm	10×10cm	60×50cm
Isolate	Candida	Candida	Candida
	tropicalis	tropicalis	tropicalis
Antifungal used	AMB	AMB	AMB
Outcome	Survived	Survived	Died

Abbreviation- y: years; MTP: medical termination of pregnancy; DM: diabetes mellitus, AMB: amphotericin B.

Table II: Review of fungal necrotizing cases in India

	References	Patient	Age	Sex	Risk Factor	Site	Isolate	Outcome
1.	Lakshmi V et al. 1993 [19]	1	15-30	Male	Post surgery (left inguinal herniorrhaphy)	Lower abdominal wall, Left testes	Apophysomyces elegans	Died
2.	Mathews MS et al 1997 [20]	1	15-30	Male	Post surgery (Lower segment cesarean section)	Anterior abdominal wall	Apophysomyces elegans	Survived
3.	Thami GP et al. 2003 [21]	1	15-30	Male	Post surgery (appendectomy)	Lower abdominal wall	Absidia corymbifera	Survived
4.	Padmaja IJ et al.	1	31-45	Male	Post surgery (appendectomy)	Lower abdominal wall to infra-clavicular region	Saksenaea vasiformis.	Died

	2006 [22]							
5.	Deepali Jain et al, 2006 [23]	18	1-75	Male	15(abscess), 1 (DM), 2 (Malignancy),	Thigh, leg, abdominal wall gluteal area	Apophysomyces elegans, A. flavus	Survived
6.	Capoor MR et al 2008 [24]	1	31-45	Male	Derma lesion	Lateral aspect of Right hip	Cryptococcus neoformans var. grubii	Survived
7.	Rath S et a 2009 [25]	1	46-60	Male	Insect bite	Upper face	Candida and Aspergillus spp.	Survived
8.	J. Chander et al 2010 [26]	9	15-90	Male	Post surgery (Appendectomy), Message, Injection, Trauma	leg, chest, anterior and posterior abdominal wall	Absidia corymbifera, Saksenaea vasiformis. Apophysomyces elegans	5 Died, 4 survived
9.	**Our case (2014)**	**3**	**15-45**	**Female**	**Pregnancy, MTP, DM**	**Anterior abdominal wall**	**Candida tropicalis**	**1 Died, 2 Survived**

DISCUSSION

NF is a disease with significant morbidity and mortality. Its pathogenesis is not clearly understood. The cause is considered weather as multi-bacterial or synergistic fungal infections.1,2 NF due to fungal organisms is uncommon and is rarely reported.5-7 In a retrospective study of 182 patients with NF, Candida was isolated in only 7 patients.14 Mortality rates for necrotizing fasciitis varies from (9-60)%.1,2,8 Predisposing factors for acquiring NF include: smoking, intravenous drug use, diabetes mellitus, immune suppression, and peripheral vascular disease.1,2 In our case series the predisposing conditions were multiple injections, pregnancy status and trauma. Review of cases of fungal NF from India is depicted in Table II . 9-16After careful review of pertinent literature, it was found that till now 8 cases of fungal NF were reported in India. The spectrum was Apophysomyces elegans. Absidia corymbifera, Saksenea vasiformis, Aspergillus flavus, Cryptococcus neoformans. Up till now only 1 case of candidal NF has been reported. It was reported in an adult male with history of insect bite on upper face and culture revealed growth of Aspergillus flavus along with Candida species. However in this case series all the patients were immune compromised (history of MTP, pregnancy, DM) and had the H/O trauma. In the world up to till now many cases of Candida NF have been reported.4,17,18,19,20 But somehow in India the reports of Candida NF are scarce. This is perhaps attributed to its misdiagnosis due to lack of clinical awareness, inappropriate sampling (i.e swab for fungal culture) and paucity of mycology laboratory.

CONCLUSION

Our case provides compelling evidence for Candida as a primary pathogen in the case of NF. No other bacteria were isolated from the patient's tissue. Our report is the first that reveals Candida tropicalis as a primary cause for NF following multiple injections and trauma. On the basis of our observation in non-healing NF cases where tissue biopsy is sterile for bacterial pathogens, possibility of a fungal aetiology especially Candida species cannot be ruled out. In all such cases of NF fungal culture should be done and susceptibility is crucial for overall patient management.

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