

RETROSPECTIVE ANALYSIS OF FUNGEMIA AMONG CHILDREN IN ANKA GENERAL HOSPITAL, NIGERIA, FROM OCTOBER 2018 TO NOVEMBER 2021: A CASE SERIES.

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BACKGROUND AND AIMS

- MSF runs a 150-bed hospital for pediatrics in Anka, an LGA in Zamfara State in Northwest Nigeria, since 2015.
- An **AMR program** has been in place since 2018 and regular blood cultures have been sent for children under-5 diagnosed with severe sepsis to better understand microbial and their resistance patterns and associations in the target population.
- Candida is the most common cause of invasive fungal infection in humans [1].
- Yeast-related bloodstream infections (BSIs)** in pediatric patients are associated with severe acute malnutrition, hematological/oncological malignancies, admission to an intensive care unit and immunosuppressive conditions [2, 3, 4].
- Fungemia is rarely described in low and middle-income countries.
- The aim of the study was to describe **clinical and microbiological features** of children under 5 years of age, who were diagnosed with severe sepsis at admission or diagnosed with treatment failure during hospitalization and in whom yeast was isolated from blood culture.
- All patients in this cohort had an intravenous cannula in situ with an average dwell time of 7 days. Seven patients (35%) had appropriate empiric antibiotics administered prior to the positive blood culture for yeast. No patient received antifungal agents

METHOD

- Eligibility criteria/case definition** was defined according to the AMR protocol for Anka General Hospital, Nigeria [5].
- A blood volume of 1-2 mL was collected from pediatric patients < 1 year and for pediatric patients >= 1 year of age a blood volume of 2.5-5mL and directly inoculated into aerobic culture medium bottles after which they were transported to the laboratory.
- Samples were incubated at 35°C and analyzed according to testing standard operation procedures (SOP) for blood culture in the laboratory.
- Late in the study period, we added germ-tube testing for presumptive identification of *Candida albicans*. Cases were identified from the laboratory database WHONET, and clinical and demographic data extracted from the patients' medical notes by two independent clinicians.

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ETHICAL REVIEW

Ethical approval was obtained from the Zamfara state Ministry of Health Ethics Department and the National Health Research Ethics Committee of Nigeria (ZSHREC03102021). A general consent procedure for routine data collection was implemented in AGH in August 2021. This research fulfilled the approval criteria set by the Médecins Sans Frontières Ethics Review Board for a posteriori analyses of routinely collected clinical data and was thus approved by MSF ERB review committee.

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RESULTS

- 20 children identified with a positive blood culture with a yeast
- 12 patients (60%) were female
- 11 patients (55%) were aged between 6-23 months
- 17 patients (85%) were categorized as severely acute malnourished (SAM)
- Nine patients (45%) had treatment failure as their case definition.
- Table 1 summarises the demographic and clinical characteristics of all identified patients

Table 1: Demographic and clinical characteristics of patients with yeast positive blood culture, Anka General Hospital, 2018-2021.

Patient Distribution		Total (N=20)	
Characteristic	n	%	
Sex			
Female	12	60	
Male	8	40	
Missing	0	0	
Age Group (Months)			
6 to 23	11	55	
24 to >=48	7	35	
missing	2	10	
Ward admitted to			
ITFC	13	65	
Pediatric	5	25	
Isolation	1	5	
COVID	1	5	
Temperature			
>38	12	60	
<38 but >35.5	3	15	
<35.5	5	25	
Severe Sepsis			
Chest focus	6	30	
Community acquired			
Gastrointestinal (GI) tract focus	2	10	
No focus specified	2	10	
Meningitis (CNS)	1	5	
Treatment failure			
Chest focus	3	15	
Gastrointestinal (GI) tract focus	2	10	
Upper respiratory focus	1	5	
Chest focus+Malaria	1	5	
No focus specified	1	5	
GI+Malaria	1	5	
Severe Acute Malnutrition			
Yes	17	85	
No	3	15	
HIV Status			
Unknown	5	25	
Positive	1	5	
Negative	14	70	
Clinical outcome			
Cured	5	25	
Transfer to MSF	8	40	
ATFC	1	5	
LAMA	1	5	
Dead	6	30	
Category of duration of hospitalisation			
1-5 days	8	40	
6-11 days	5	25	
>=12days	7	35	
Time from admission to death (for those that died)(N=6)			
1 to 5 days	3	50.0	
6 to 10	1	17.0	
11 to 15	1	17.0	
>=16days	1	17.0	

*LAMA=Left against medical advice, N=Number, ATFC= Ambulatory Therapeutic Feeding Centre

* ITFC=In-patient Therapeutic Feeding Center, HIV=Human Immunodeficiency

CONCLUSION

- This descriptive study highlights the need to include lab diagnosis for fungemia in programs with secondary-level care with an integrated AMR component
- This study highlights the need to increase awareness about the possibility of fungemia and to include antifungal treatment in hospitals where patients with severe sepsis and SAM are being admitted.

Figure 1: Isolated yeast from a pediatric blood culture from Anka General Hospital, 2018-2021



RECOMMENDATION FOR MSF

This study recommends:

- The inclusion of antifungal treatment in all ITFC programs and
- The to have an updated microbiological SoP to include details on the isolation of yeast to speciation level.