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PROPORTION OF PAEDIATRIC ADMISSIONS WITH ANY STAGE OF NOMA AT THE ANKA GENERAL HOSPITAL, NORTHWEST NIGERIA

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BACKGROUND AND OBJECTIVES

Noma is a rapidly spreading infection of the oral cavity, which mainly affects children. Without early treatment, high mortality rate is anticipated.

Simple gingivitis is a warning sign for noma, and acute necrotising gingivitis is the first stage of noma.

The epidemiology of the disease is also not well understood. The WHO estimates that 140,000 children contract noma each year globally [1]. In 2003, a northwest Nigerian study estimated the noma incidence was 6.4 per 1000 children from 1996 to 2001 [2]. A recent study estimated that the period prevalence of noma from 2010–2018 was 1.6 per 100,000 population at risk in northern Nigeria [3]. A 2019 prevalence study in Sokoto and Kebbi states, Nigeria, identified that in children aged 0 to 15 years (n = 7122), simple gingivitis was diagnosed in 3.1% (n = 181; 95% confidence interval (CI) 2.6–3.8), acute necrotising gingivitis in 0.1% (n = 10; CI 0.1–0.3), and oedema (stage 2 noma) in 0.05% (n = 3; CI 0.02–0.2), no late-stage noma cases were identified [4].

Risk factors for noma include poor oral hygiene, limited access to quality health care including routine childhood vaccinations, low socioeconomic status and immunosuppression resulting from comorbidities such as malnutrition, measles and HIV.

We aimed to understand the prevalence of all stages of noma in hospitalized children.

Primary objective
To estimate the proportion of paediatric admissions over a three month period with any stage of noma at the Anka General Hospital (AGH), Zamfara, northwest Nigeria.

METHODS

We conducted a prospective observational study from 1st June to 24th October 2021, using face-to-face interviews with parents/guardians of paediatric patients (aged under 12 years), enrolling patients aged 0 to 12 years who were admitted to the Anka General Hospital, Zamfara, Nigeria. Participants underwent anthropometric and oral examinations upon admission and discharge, along with a review of hospital records.

RESULTS

Of the 2346 patients, 58 (2.5%) were diagnosed with simple gingivitis and 6 (0.3%) with acute necrotising gingivitis (ANG) upon admission. Of those admitted to the Inpatient Therapeutic Feeding Centre (ITFC), 3.4% (n = 37, CI 2.5–4.7%) were diagnosed with simple gingivitis upon admission compared to 1.7% of those not admitted to the ITFC (n = 21, CI 1.1– 2.6%) (p = 0.008).

We analysed risk factors for simple gingivitis using logistic regression, considering variables like patient age, wealth score, admission status, malnutrition, recent illness, oral health issues, caretaker status, colostrum intake, pap consumption, and vaccination history (including measles and malaria). These factors are known risk factors for noma.
Children aged between six months and five years who suffered from chronic malnutrition exhibited a higher likelihood of being diagnosed with simple or acute necrotising gingivitis compared to those without chronic malnutrition (63.5% vs 49.7%; p = <0.05) (Table 1).

Risk factors identified for having simple gingivitis included being aged over two years (2 to 6 years old, odds ratio (OR) 3.4, CI 1.77–6.5; 7 to 12 years OR 5.0, CI 1.7– 14.6; p = <0.001), being admitted to the ITFC (OR 2.1; CI 1.22–3.62) and having oral health issues in the three months before the assessment (OR 18.75; CI 10.65, 33.01). Among children aged 6 to 59 months with ANG (n=4), all had chronic malnutrition.

The most common oral health issues reported (n = 265, 11.4%) were a sore in the mouth (n = 149, 56.2%), bleeding gums when touched (n = 88, 33.2%) and sore gums (n = 34, 12.8%). Almost all the respondents (n = 2274, 97.4) had not had an oral health check in the past year. These findings highlight significant gaps in access to and utilisation of oral health care services.

DISCUSSION

Our study showed that children admitted to the Anka General Hospital are at risk for simple or acute necrotising gingivitis. The risk increases with age. Malnutrition is linked to simple and acute necrotising gingivitis. These findings are coherent with two community-based studies conducted in northwest Nigeria (2020) and Cameroon (2015). Accessing oral health care presented challenges for parents/guardians due to transport difficulties and the hospital's distance from their home. Furthermore, the majority of respondents had not received an oral health check in the past year. The lack of access to and uptake of oral health care indicates a strong need for oral screening in the communities and oral examinations in health and nutrition services. This provision could decrease the chance of patients developing noma.

NOMA STAGES

WHO classifies noma into 5 clinical stages: stage 0 – simple gingivitis (gum inflammation); stage 1 - acute necrotising gingivitis; stage 2 - oedema; stage 3 - gangrene; stage 4 - scarring; and stage 5 - sequelae.

Figure 1: The 5 clinical stages of noma (1-5) L-R. *source: MSF-OCA

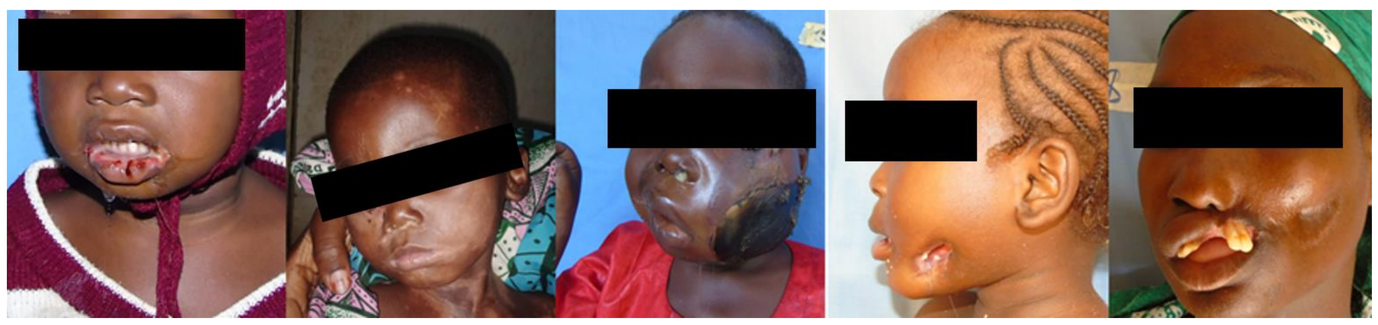

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Table 1: Malnutrition estimates by simple/ acute necrotising gingivitis diagnosis (unadjusted)

	TOTAL		Simple or acute necrotizing gingivitis		No noma/ gingivitis		Ch sq
Chronic malnutrition (6 months-5 year olds)	N = 1909	%	N = 52	%	N = 1857	%	<0.05
No	954	50.0%	19	36.5%	935	50.4%	
Yes	955	50.0%	33	63.5%	922	49.7%	
Acute malnutrition (6 months-5 year olds)	N = 1910	%	N = 49	%	N = 1861	%	0.74
No	548	28.7%	13	26.5%	535	28.8%	
Yes	1362	71.3%	36	73.5%	1326	71.3%	
Acute malnutrition (6–12 year olds)	N = 98	%	N = 6	%	N = 92	%	0.59
No	55	56.1%	4	66.7%	51	55.4%	
Yes	43	43.9%	2	33.3%	41	44.6%	

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ETHICS STATEMENT

This study has been reviewed and approved by the Medecins Sans Frontieres Ethics Review Board (ERB) (2017) and has Nigerian ethical approval (NHREC/01/01/2007-29/04/2021), Zamfara Ministry of Health ERB (ZSHREC01112020) and the Usman Danfodiyo University Teaching Hospital Health Research and Ethics Committee in Nigeria (NHREC/30/012/2019).

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