

Missed Opportunities in Primary Prevention of Rheumatic Heart Disease: Evidence from Nigerian Clinical Practice

Igoche D. Peter

igopeter@gmail.com

Federal University of Health Sciences

Ejemeirele M. Omokhuale

The Limi Children's Hospital

Research Article

Keywords:

Posted Date: June 24th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9588366/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Introduction

: Primary prevention of rheumatic heart disease by medical practitioners is doable and more cost effective than managing the eventual chronic morbidities that can ensue if diagnosis of group A beta-haemolytic Streptococcus pharyngitis is missed or poorly treated.

Aim

to determine the knowledge of, and primary preventive practices of rheumatic heart disease among paediatricians and junior doctors in Nigeria.

Methods

A cross-sectional descriptive study conducted among doctors in Nigeria, recruited via several professional WhatsApp platforms using an electronic self-administered questionnaire. Data was analysed using IBM SPSS version 29.

Results

Total of 153 eligible medical practitioners in Nigeria participated in this study, 75(49%) being paediatricians while 78(51%) are junior doctors. While paediatricians were significantly more aware of the modified Centor's score- 58(77.3% vs 47(60.3%); $p = 0.02$, score adherence was not significantly so- 6(8.0%) vs 2(2.6%); $p = 0.17$. Frequency of "always" throat examination for febrile children aged 5–15 yrs with sore throat differed significantly between paediatricians and junior 38(50.6%) vs 24(30.8%); $p = 0.01$, but there was no significant difference between paediatricians and junior doctors with respect to "always taking" a throat swab for microscopy, culture and sensitivity in a febrile child with hyperaemic pharynx"- 24(42.1%) vs 22(28.2%); $p = 0.09$. Frequency of throat swabbing was uniformly poor in both participant groups ($\chi^2 = 1.67$, $p = 0.87$). Oral amoxicillin is commonest empiric antibiotic prescribed for acute exudative pharyngitis, but largely with suboptimal duration.

Conclusion

Clinico-laboratory diagnostic knowledge of Streptococcal pharyngitis, diagnostic practices, and antibiotic therapy as primary preventive strategy against rheumatic heart disease by medical practitioners in Nigeria is suboptimal.

Background

Rheumatic heart disease (RHD), although preventable, has remained highly prevalent in Nigeria where the disease-associated morbidity and premature mortality remains significant among the young populations.^{1,2} Available data shows a high prevalence of up to 38.5% from hospital and echocardiography-based RHD reports from Nigeria.³ It is conceivable that this figure underestimates the true community burden as latent RHD is not captured in hospital data.

Primary prevention of RHD by medical practitioners is doable and more cost effective than managing the eventual chronic morbidities that can ensue if diagnosis of group A β -haemolytic *Streptococcus* pharyngitis is missed or poorly treated. Evidence from low- and middle-income countries demonstrates that early antibiotic therapy is highly effective in preventing acute rheumatic fever, yet implementation remains limited in resource-constrained settings.⁴ Corroborating this poor implementation, Isezuo et al⁵ in Sokoto, Nigeria reported that the practice of prompt antibiotic treatment of streptococcal pharyngitis is suboptimal among healthcare practitioners in Nigeria, largely due to gaps in healthcare worker knowledge and practice.

While Isezuo et al⁵ studied primary healthcare workers, in the present study we examined the primary preventive practices of RHD (with respect to diagnosis of, and optimal antibiotic therapy for group A β -haemolytic streptococcal pharyngitis) among paediatricians in comparison with junior healthcare professionals who care for children. This is the first report in Nigeria that examines such practices among the healthcare professionals who should know better in comparison with the RHD prevention practices by junior medical practitioners. Our findings contribute valuable data shortfalls in routine practitioner-related RHD primary prevention strategies, and this will serve as platform to inform strategies to improve practice.

Methods

This was an observational, descriptive, cross-sectional comparative study. The study population comprises of 153 clinicians in Nigeria of which 75 are paediatricians and 78 junior medical practitioners (including junior residents and medical officers) who treat children routinely, including at least a febrile child in the last 12 months prior to enrolment into the present study. Doctors doing their internship at the time of data collection were excluded. Study participants were recruited via several professional WhatsApp platforms. Data collection was via a self-administered electronic self-administered questionnaire.

Data analysis

Data were analysed using SPSS (Statistical Package of Social Sciences) V.28.0, and described using percentages, tables and charts. Chi square or Fisher exact tests were used to determine association between clinician category and RHD prevention practice characteristics. The level of significance was set at $p < 0.05$.

Results

Table 1 depicts the demographic characteristics of the study participants including 70 paediatricians (49.0%) and 73 (51.0%) non-paediatrician clinicians, with 16.33±7.38 years and 7.89±5.85 years of experience respectively.

Table 1
Demographic characteristics of study participants

Parameter	n (%), years
Gender	57 (37.3%)
Male	96 (62.7%)
Female	
Clinician category	75 (49.0%)
Paediatricians	78 (51.0%)
Junior doctors	
Years of experience	16.33±7.38 yrs
Paediatrician	7.89±5.85 yrs
Non-Paediatrician	

Adherence to use of the modified Centor scoring was defined as when this scoring is done for febrile children with clinical suspicion of acute pharyngitis. In accordance with this, Fig. 1 demonstrates that only 6% are adherent.

While the paediatricians were significantly more aware of the modified Centor’s score- 58(77.3% vs 47(60.3%); p = 0.02, its “always” diagnostic use- 6(8.0%) vs 2(2.6%); p = 0.17, did not differ significantly between paediatricians and junior doctors. Additionally, more paediatricians “always examine” the pharynx of a febrile child- 38(50.6%) vs 24(30.8%); p = 0.013, however, there was no significant difference between paediatricians and junior doctors with respect to “always taking” a throat swab for microscopy, culture and sensitivity in a febrile child with hyperaemic pharynx”- 24(42.1%) vs 22(28.2%); p = 0.09.

Overall duration of antibiotic therapy was optimal in 63 of the 143 study participants (44.0%). Oral amoxicillin was the commonest prescribed antibiotic (Fig. 2); with optimal treatment duration prescription practice only among 58 (45.7%) of the 127 routine prescribers, while 69 (54.3%) of them prescribe same medication at sub-optimal treatment duration.

Discussion

In the present study, although paediatricians were more aware of the modified Centor's core, this did not translate to better use of this score in clinical practice, signifying a major "know-do gap"; knowledge not necessarily translating to practice. This finding is similar to two different reports by Alkhazi et al⁶ and Shaikhomer et al⁷ respectively, among Saudi Arabian doctors; although consultants were more aware of the modified Centor criteria compared with junior doctors, less than half of them applied it in clinical practice. Apart from probable poor knowledge of this scoring system, reasons for this practice gap in these studies in same low- and middle- income country context is presently unclear. A qualitative study designed to explain these findings should be revealing so that strategies to address this awareness and clinical practice gap through targeted campaigns on primary prevention of rheumatic heart disease would help standardize adherence.

Although it is recommended that throat examination should be routinely performed in febrile children to detect signs suggestive of bacterial pharyngitis,⁸ this practice was significantly more prevalent among the paediatricians than the junior doctors. This finding of poorer throat examination among the junior doctor's population is in tandem with the report by Hassan⁹ among medical interns' practice of diagnosis of bacterial pharyngitis in Khartoum, Sudan. Their poorer throat examination practice may be attributed to poorer-to-moderate knowledge regarding diagnosis and management of bacterial pharyngitis in children. Again, we observed that although more paediatricians physically examined the pharynx, this did not translate to better frequency of pharyngeal swabbing for laboratory cultures when compared with the practice of the junior doctors. This is yet another gap in practice that deserves to be unraveled.

The present study reveals that oral amoxicillin was the most commonly prescribed antibiotics by all cadres of medical practitioners, and this is similar to the recent findings from a systematic review and meta-analysis of antimicrobial prescription patterns for upper respiratory tract infections in Africa by Kasse et al.¹⁰ From a recent report by Isezui et al,¹¹ of high antimicrobial resistance to amoxicillin from pharyngeal isolates, there is the need for more attention on antimicrobial stewardship to limit antimicrobial resistance.

While sub-optimal antibiotic duration in the management of paediatric pharyngitis has been attributed to poor adherence according to Sarrell and Giveon,¹² we made a disturbing observation of sub-optimal antibiotic dosing duration by more than half of the participating medical practitioners. A similar observation was made by Lehrer et al,¹³ who found that less than one-third of antibiotics prescribed to paediatric outpatients in Tennessee were optimal for duration! Shorter durations on antibiotics may compromise microbiological cure, hence compromising the primary prevention of rheumatic heart disease in addition to development of antimicrobial resistance. There is need for outpatient antimicrobial stewardship efforts.

Conclusion

Clinico-laboratory diagnostic knowledge of group A β -haemolytic Streptococcus pharyngitis, diagnostic practices, and antibiotic therapy as primary preventive strategy against rheumatic heart disease by medical practitioners in Nigeria is suboptimal. Even among the medical practitioners who were better aware of diagnosis and treatment of bacterial pharyngitis, a critical practice gap exist!

Limitations

A contextual explanation of the critical practice gaps identified were not explored based on the study design. Future, more robust explanatory sequential mixed methods studies will give richer insights.

Abbreviations

Not applicable.

Declarations

Ethics aprocal and consent to participate

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval for the study was obtained from the Limi Hospital Group's Review Board/Ethics Committee prior to commencement. In addition, the study adhered to the standards set by the Council for International Organizations of Medical Sciences International Ethical Guidelines for Health-related Research Involving Humans. Written informed consent was obtained from all participants before enrollment into the study. Confidentiality and anonymity of participants were strictly maintained throughout the research process.

Consent for publication

Not applicable.

Competing interests

Nil

Clinical trial number

Not applicable.

Funding

declaration

Not applicable.

Author Contribution

IDP conceptualized the topic and wrote the initial draft. EMO collected the data, contributed to the concept and critically reviewed the manuscript.

Acknowledgement

We acknowledge the medical practitioners in Limi Children's Hospital Abuja for their support

Data Availability

The data that support the findings of this study are available from [I.D.P at igopeter@gmail.com]. The data are, however, available from the authors upon reasonable request and with permission from [I.D.P.]. Survey form used for this study was developed for this study and has not been published elsewhere. I has been uploaded as a supplementary file.

References

1. Shogade TT, Udosen AU, Udoh EM, Tanimowo MO, Ukpung OY, Nwabueze CU, Umoh IO, Essien CE, Ekrikpo UE, Ekpe EE, Ojji DB. Prevalence, pattern and trend of rheumatic heart disease in a tertiary hospital in Nigeria: A 12-year retrospective echocardiographic study. *Eur Heart J*. 2023;44(Supplement2):ehad655–1728.
2. Chinawa JM, Chinawa AT, Ogbuka FN, Elobuik PC, Nwankwo O. The Prevalence Rates of Acute Rheumatic Fever in Africa: A Systematic Review and Meta-Analysis. *Sage Open Pediatr*. 2025;12:30502225251357145.
3. Ogah OS, Bode-Thomas F, Yilgwan C, Ige O, Ogah F, Ogunkunle OO, Okwuonu C, Sani M. Rheumatic heart disease in Nigeria: A review. *Nigerian J Cardiol*. 2020;17(1):27–36.
4. World Health Organization. WHO guideline on the prevention and diagnosis of rheumatic fever and rheumatic heart disease. World Health Organization; 2024 Oct. p. 29.
5. Isezuo KO, Awosan KJ, Ango UM, Mohammed Y, Sani UM, Waziri UM, Garba BI, Adamu AU, Jiya FB. Knowledge, attitude, and practice regarding prevention of rheumatic heart disease among primary health-care workers in Sokoto metropolis, Sokoto State, Nigeria. *Ann Afr Med*. 2023;22(1):61–9.
6. Alkhazi AA, Alessa KM, Almutairi AM, Almadi HA, Akkam A, Almutairi MK, Alhamad OA, Ghazal HS. Improving pediatric emergency department physicians' adherence to clinical practice guidelines on the diagnosis and management of group A beta-hemolytic streptococcal pharyngitis—a cross-sectional study. *Int J Emerg Med*. 2018;11(1):49.

7. Shaikhomer M, Timraz JH, Metwali NY, Bava FS, Yusuf Z, Ahmed RA, Thalib HI, Hashim SN. Physicians' knowledge and adherence to Centor Criteria for preventing acute rheumatic fever in Jeddah, Saudi Arabia. *J Med Life*. 2025;18(5):449.
8. Gerber MA. Diagnosis and treatment of pharyngitis in children. *Pediatr Clin North Am*. 2005;52(3):729.
9. Hassan M. Knowledge, attitude, and practice of house officers to the diagnosis and management of bacterial pharyngitis: A multicenter cross-sectional study. *Cureus*. 2022;14(11).
10. Kasse GE, Cosh SM, Humphries J, Islam MS. Antimicrobial prescription pattern and appropriateness for respiratory tract infection in outpatients: a systematic review and meta-analysis. *Syst Reviews*. 2024;13(1):229.
11. Isezuo KO, Abubakar J, Mohammed Y, Sani UM, Waziri UM, Garba BI, Adamu A, Jiya FB, Ibrahim A, Dada KM, Ango UM. Antimicrobial susceptibility pattern of pharyngeal isolates of children seen in a tertiary facility in Sokoto over three years (2022–2024). *Nigerian Med Journal: J Nigeria Med Association*. 2025;66(2):586.
12. Sarrell EM, Giveon SM. Streptococcal pharyngitis: a prospective study of compliance and complications. *Int Sch Res Notices*. 2012;2012(1):796389.
13. Lehrer BJ, Mutamba G, Thure KA, Evans CD, Hersch AL, Banerjee R, Katz SE. Optimal pediatric outpatient antibiotic prescribing. *JAMA Netw Open*. 2024;7(10):e2437409.

Figures

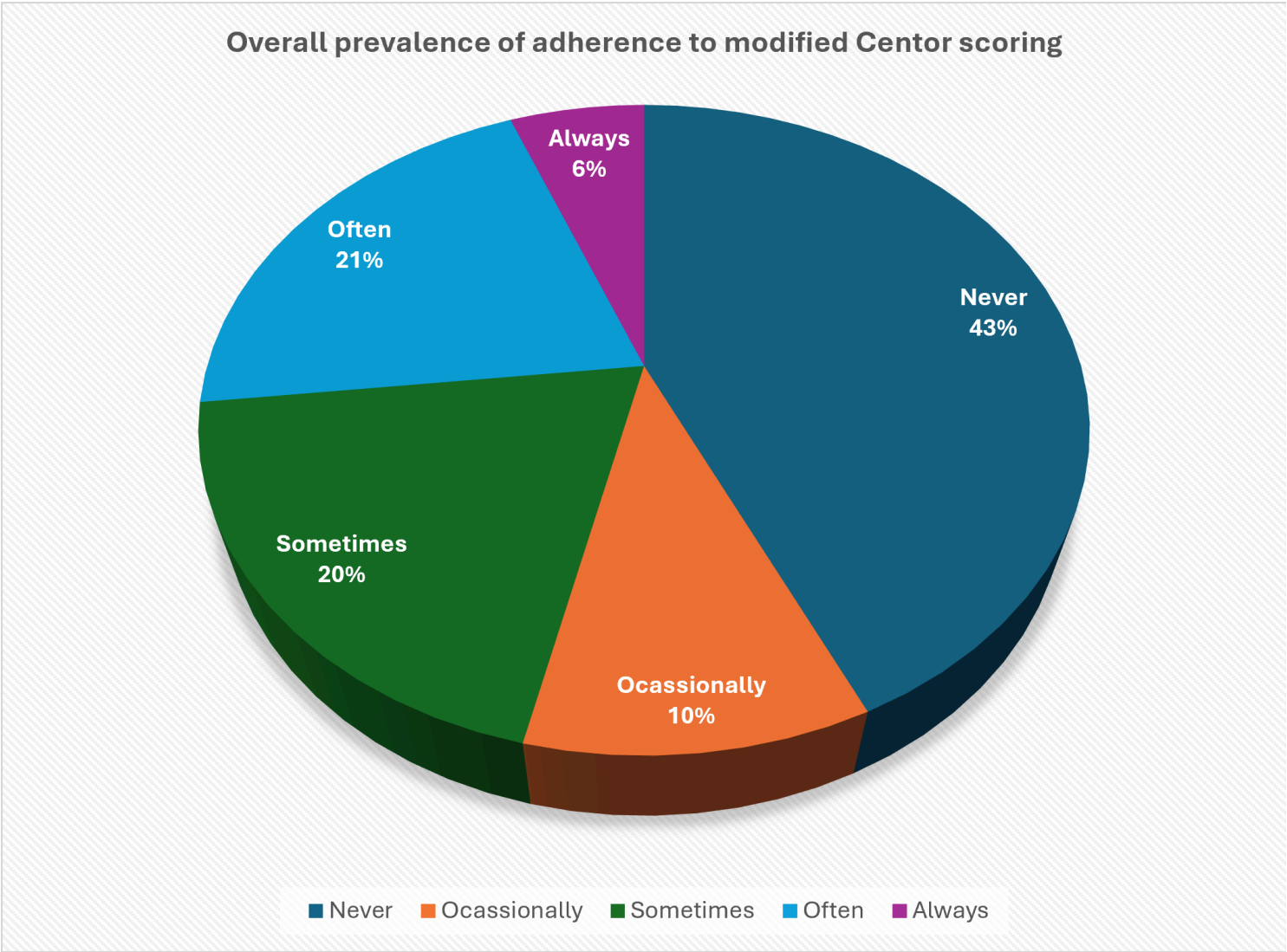


Figure 1

Overall prevalence of adherence to modified Centor scoring

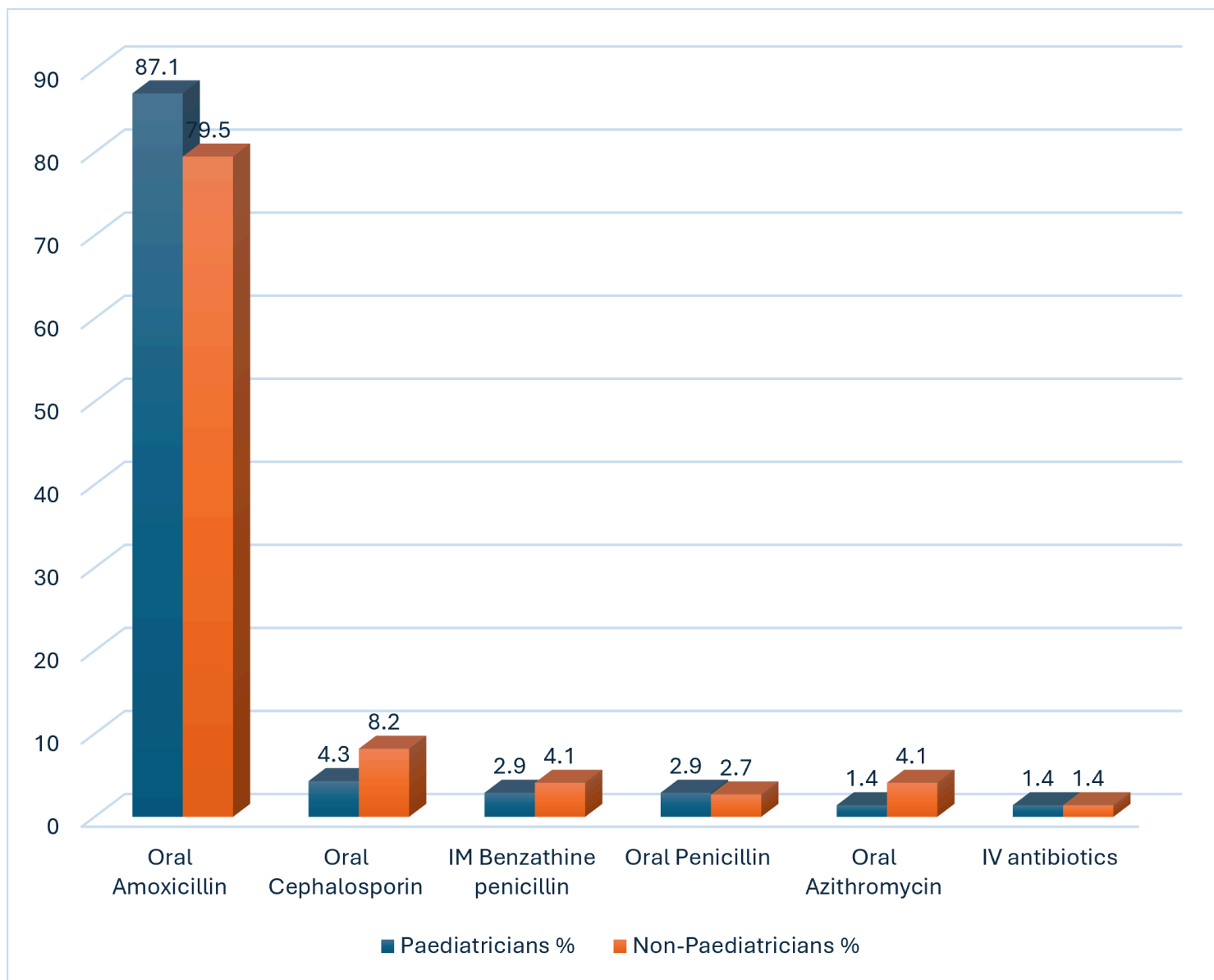


Figure 2

Cluster bar charts showing frequency of antibiotic prescription for group A b-haemolytic streptococcal pharyngitis

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Questionnaire.pdf](#)