

## PHYSICIANS MANAGEMENT OF SORE THROAT IN CHILDREN IN BENIN CITY, NIGERIA

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### ABSTRACT

**Introduction:** Sorethroat is a common reason for presentation in primary paediatric care. Because only a minority of cases of pharyngitis is caused by bacteria, physicians have been guided by various recommendations on the judicious use of antibiotics to avoid overprescription. In the absence of guidelines, the treatment approaches between physicians may differ. The management of children with sorethroat by physicians in Benin City, Mid-Western Nigeria was evaluated.

**Subjects and Methods:** The experience and practice of 25 paediatricians and 30 non paediatricians who routinely attend to children with sorethroat in Benin metropolis, Nigeria were evaluated with the aid of a self administered questionnaire. Information sought for included biodata, empirical antibiotic prescription. The choice of antibiotic and complications of pharyngitis encountered in practice.

**Results:** Majority of respondents 31(56.4 %) considered viruses as the commonest cause of pharyngitis. Despite this an equal proportion 31(56.4 %) treated children with sorethroat empirically with antibiotics. Of these, significantly more paediatricians 19(61.3 %) than non paediatricians 12(38.7 %) considered viruses the commonest cause of pharyngitis,  $P = 0.013$ . CI (0.10 0.63). Almost three quarter (72.7 %) of respondents examine the throat of the children while only 18.2 % obtained throat swab for microbiological analysis. The 24 doctors who did not treat empirically would prescribe antibiotic if the patient has purulent pharyngeal exudates, fever and adenitis. Augmentin and cefuroxime were the most prescribed antibiotics.

**Conclusion:** A lot of children served by these doctors receive antibiotic needlessly from empirical antibiotic treatment of pharyngitis. National guidelines on appropriate antibiotic use is needed to promote rational use of antibiotics and reduce antibiotic overuse.

**Key Words:** Sorethroat, streptococcal, antibiotic, physicians, Benin

*(Accepted 5 December 2008)*

### INTRODUCTION

Sorethroat which is a major symptom of pharyngitis is a common presentation at paediatric primary care.<sup>1,2</sup> Although most cases of pharyngitis are caused by viruses,<sup>3</sup> group A B haemolytic streptococcus (GABHS) pharyngitis is the major bacteria requiring antibiotic use.<sup>4,5</sup> Antibiotic therapy in GABHS pharyngitis is known to reduce the illness duration, the spread of the disease, relieves acute symptoms and prevents rheumatic fever and suppurative complications.<sup>6,7</sup> Rheumatic fever and rheumatic heart disease is still a significant cause of morbidity in developing countries.<sup>8</sup> GABHS accounts for 15-37 % of pharyngitis in children in the United States.<sup>9-11</sup> In a study conducted in Benin City, Nigeria, hemolytic streptococcus accounted for 26 % of all causes of tonsillopharyngitis.<sup>2</sup> Although the performance of throat culture isolating GABHS is a requirement for antibiotic treatment,<sup>12</sup> laboratory facilities is inaccessible in most primary health centres and

unaffordable by the larger population in resource poor countries.<sup>13</sup> The use of rapid antigen tests that have been shown to facilitate the early diagnosis of GABHS in practices in Western countries, are not readily available in the developing countries. The use of clinical scoring of symptoms are not reliable,<sup>14</sup> and since a decision to prescribe antibiotic or not has to be taken about the patient with pharyngitis, empirical antibiotic treatment of sorethroat may be resorted to. The attendant antibiotic overuse leads to the emergence of resistance to such antibiotics and increased cost to the patient.<sup>15</sup> Physicians in Western countries are guided by recommendations in guidelines on management of sorethroat.<sup>12,16</sup> In Nigeria, there are no guidelines or recommendation on appropriate antibiotic treatment of pharyngitis. The approaches of physicians to managing pharyngitis therefore may be influenced by individual physician's experience, knowledge of the condition and expertise. This study was therefore carried out to evaluate the management approaches of physicians attending to children with sorethroat in Benin City, in Mid-Western Nigeria.

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## SUBJECTS AND METHODS

The practice and experience of doctors managing children with sorethroat in the Benin City metropolis in Mid Western Nigeria, were evaluated using a self administered questionnaires. The metropolis is home to a variety of health facilities caring for children. They include a tertiary centre, two large secondary centres of which one is a state owned specialist hospital and the other a large mission hospital. There are three private paediatric clinics. The paediatric clinics are run by a paediatrician and supported by medical officers (Medical officers are general duty doctors with little or no postgraduate training in medicine). Questionnaires were delivered by hand to doctors at their working places in the four health facilities that care for majority of children from Benin City: (1) the departments of Child Health and General Medical Practice of the tertiary centre. Respondents were paediatricians, family physicians, residents in family medicine and paediatrics. (2) The paediatric department of the State owned Specialist Hospital, where respondents were paediatricians and medical officers. (3) The department of paediatrics of the mission and respondents were medical officers. (4) One of the privately owned paediatric clinics where respondents were medical officers. Completed questionnaires were later retrieved from the doctors. The study population was divided into two cohorts, the paediatricians cohort consisting of paediatricians from the different facilities and paediatric residents at UBTH. The non Paediatrician cohort comprised medical officers from the different facilities, family physicians and residents in family medicine at the tertiary centre. The questionnaire sought information on the doctors' biodata; which included age, gender, rank of the doctor, duration of practice and place of practice. The frequency with which the respondents see children with sorethroat, examine the throats and obtain throat swabs from these children in their practice was ascertained. It was also determined whether all cases of pharyngitis were treated empirically with antibiotic, and if not the factors that influenced the decision to prescribe antibiotics were ascertained. The usual choice of antibiotic and route of administration were evaluated. The commonest organisms considered responsible for sorethroat and the complications of pharyngitis encountered in their practice were sought for.

### Statistical analysis

The responses were coded and fed into SPSS package 11.0 and analysis done with the package. Simple proportions were represented in percentages, while differences in proportion were evaluated by Fisher's exact test.  $P < 0.05$  was considered statistically significant.

## RESULTS

Of the 65 questionnaires distributed, 55 questionnaires were returned giving a response rate of 84.62%. There were 28 (50.91%) males and 27 (49.09%) females giving a M:F ratio of 1:1. There were 25 (45.5%) doctors in the paediatricians cohort and 30 (54.5%) were non paediatricians. Of the non paediatricians, 10 (33.3%) were family physicians or residents in family medicine and 20 (66.7%) were medical officers in government or private hospital. Most of the doctors 23 (41.8%) were aged 31 to 35 years of age, 22 (40.0%) were 10 to 20 years of age and the least 3 (5.5%) were older than 40 years. Table 1. Half of

The doctors 28 (50.9%) had been practicing for 5 to 10 years, 22 (40.0%) for less than 5 years and five (9.1%) for over 10 years. Two fifths of respondents 22 (40.0%) see children with sorethroat frequently, 32 (58.1%) see such children occasionally and 1 (1.8%) rarely see them in their practice. Majority of respondents 31 (56.4%) treated all cases of pharyngitis empirically with antibiotic. Of these, 14 (45.2%) were paediatricians and 17 (54.8%) non paediatricians. This was not statistically different,  $p = 1.00$ . Doctors practicing for over five years 19 (61.3%), and doctors older than 30 years 21 (67.7%) were more likely to treat all cases empirically with antibiotics though this was not statistically significant. Table 2. The other 24 doctors, who did not treat all cases empirically with antibiotic, would prescribe an antibiotic if the following factors were present: Sixteen (66.7%), 14 (58.3%) and 10 (41.7%) of respondents would prescribe an antibiotic if purulent exudates, fever and adenitis respectively were present in the patient. Parent's demand for antibiotic was the least reason cited for adding antibiotic to treatment. Table 3. The usual antibiotics prescribed by most respondents were augmentin 39 (70.9%) and cefuroxime 8 (14.6%), while azithromycin and penicillin V were the least prescribed antibiotic by 3 (5.5%) respondents. Table 3. Over half of the respondents 31 (56.4%) considered viruses to be the commonest cause of sorethroat in their practice, while 21 (38.2%) felt bacteria was the commonest cause of pharyngitis. Three (5.5%) could not tell which organism was the commonest in their practice. Sixteen (51.6%) of respondents who treated empirically and 15 (62.5%) of respondents who did not treat empirically considered viruses the commonest cause of pharyngitis. Of the respondents who treated empirically, significantly more paediatricians 19 (61.3%) compared to non paediatricians 12 (38.7%) felt viruses were the commonest cause of sorethroat. This difference was statistically significant,  $p = 0.013$ . CI (0.10 to 0.63). Although more non paediatricians 15 (71.4%) considered bacteria to be the commonest cause of sorethroat than paediatricians 6 (28.6%), the difference was not significant.  $P = 0.057$  CI (0.001 to 0.54) Almost three quarters 40 (72.7%) of respondents examine the throats of children with sorethroat always or most of the time. More of the respondents 25 (80.6%) who treated empirically compared to those who did not 15 (62.5%) examined the throats of children with pharyngitis either all the time or most of the time. The difference was not statistically significant,  $p = 0.222$ . Significantly more paediatricians 22 (88.0%) examined the throats of children with sorethroat all the time or most of the time compared to non paediatrician 18 (60.0%).  $P = 0.032$ .

Almost half 24 (43.6%) of the doctors would occasionally treat children with pharyngitis with injectable antibiotic. Of these 11 (45.8%) were Paediatricians and 13 (54.2%) were nonpaediatricians.  $p = 1.00$ . Doctors with more than 5 years experience 16 (66.7%) were more likely to give injectable antibiotic compared to doctors with shorter experience 8 (33.3%). This was however not statistically significant,  $p = 0.417$ . The most frequently seen complication of pharyngitis by respondents in their practice was acute glomerulonephritis 25 (45.5%). Other complications were rheumatic fever 17 (30.9%), rheumatic heart disease 16 (29.5%), peritonsillar abscess 14 (25.5%) and chronic renal failure 4 (7.36), Table 3.

Table 1: Characteristics of Study Population.

Characteristic	Paediatrician n (%)	Non Paediatrician n (%)	Total n (%)
<b>Age</b>			
20 – 25 yrs	0 (00.0)	1 (100.0)	1 (1.9)
26 – 30 yrs	7 (33.3)	14 (66.7)	21 (38.2)
31 – 35 yrs	11 (47.8)	12 (52.2)	23 (41.8)
36 – 40 yrs	4 (57.1)	3 (42.9)	7 (12.7)
>40 yrs	3 (100.0)	0 (00.0)	3
<b>Gender</b>			
Females	14 (51.9)	13 (48.1)	27 (%)
Males	11 (39.3)	17 (60.7)	28 (%)
<b>Duration of practice</b>			
< 5 yrs	10 (45.5)	12 (54.5)	22
5 – 10 yrs	15 (53.6)	13 (46.4)	28
> 11 yrs	1 (20.0)	4 (80.0)	4
<b>Place of practice</b>			
Private hospitals	2 (20.0)	8 (80.0)	10
Govt. hospitals	2 (42.1)	7 (57.9)	19
UBTH	22 (61.1)	14 (38.9)	26

Table 3: Respondents Reasons for Prescribing Antibiotic, Usual Antibiotic Prescribed and Complications of Sorethroat Seen in Practice.

Characteristics	No of respondents		Total (%)
	Paediatricians	Non paediatricians	
<b>Reasons for prescribing antibiotic</b>			
Secondary bacteria infection	9	7	16 (66.7)
Purulent discharge	10	6	16 (66.7)
Fever	4	10	14 (58.3)
Cervical adenitis	4	6	10 (41.7)
Presence of exudates	5	4	9 (37.5)
Cough	1	6	7 (29.2)
Parental demand	1	2	3 (12.5)
Catarrh	0	0	0 (0.0)
<b>Antibiotic prescribed by physiciens</b>			
Augmentin	19	20	39(70.9)
Cefuroxine	4	4	8(14.5)
Cotrimoxazole	2	4	6(10.9)
Ampiclox	5	1	6(10.9)
Ampicillin	2	4	6(10.9)
Penicillin V	1	2	3(5.5)
Azithromycin	2	1	3(5.5)
<b>Common complications seen</b>			
Acute glomerulonephritis	16	9	25(45.5)
Rheumatic heart disease	9	8	17(30.1)
Rheumatic fever	6	10	16(29.1)
Peritonsillar abscess	4	10	14(25.5)
Chronic renal failure	2	2	4(7.3)

**Table 2: Empirical Treatment of all Patients with Antibiotic According to Age, Gender, Rank, Duration of Practice and Place of Practice of Respondents.**

Charateristics	Response to empirical treatment			p value
	No	Yes	Total	
<b>Age</b>				
<30 years	12	10	22	0.91
>30 years	12	21	33	
<b>Gender</b>				
Female	10	17	27	0.42
Male	14	14	28	
<b>Rank</b>				
Paediatrician	11	14	25	1.00
Non paediatrician	13	17	30	
<b>Duration of practice</b>				
< 5 years	11	12	23	0.58
> 5 years	13	19	32	
<b>Place of practice</b>				
Teaching hospital	22	4	26	0.076
Other sites	18	11	29	

## DISCUSSION

In this study, 56.4% of the respondents treated children with pharyngitis empirically with antibiotic. The absence of local guidelines, ignorance and or lack of application of foreign recommendations<sup>16</sup> on rational antibiotic use for pharyngitis may have been responsible for this management approach. This may perhaps also explain why there was no significant difference between the number of paediatricians and non paediatricians who treated empirically with antibiotic. The respondents' knowledge about viral agents being the causative agents for most cases of pharyngitis did not seem to make much impact on their antibiotic prescribing behaviour. Over half of the respondents who treated empirically considered viruses the commonest cause of pharyngitis. This knowledge should have made them less inclined to treat empirically with antibiotic. This unexpected treatment approach was more pronounced amongst paediatricians as significantly more of them who treated empirically considered viruses the commonest cause of pharyngitis. It is not clear why this was more so amongst paediatricians. Empirical antibiotic therapy undoubtedly will lead to overuse of antibiotics and emergence of bacterial resistance. The rising trend of resistance of streptococcal organisms to commonly used antibiotics has been linked to antibiotic overuse.<sup>17,18</sup> In resource poor countries such as ours, this holds grave public health consequences as use of ineffective antibiotics against common pathogen may worsen the severity and duration of the illness, increase mortality and increase cost of healthcare due to purchase of multiple antibiotics. The unnecessary antibiotic use from inappropriate prescriptions also adds on to the healthcare cost. The decision to treat with antibiotic was based on the presence of fever, adenitis and exudate in the pharynx. Although there are no national guidelines, these respondents seem to have adopted an approach consistent with established

recommendations.<sup>5,16</sup> This practice may have been informed by individual knowledge since both paediatricians and non paediatricians had this approach to antibiotic use. The establishment of national guidelines and targeted education of health professionals on these guidelines may lead to significant reduction of antibiotic prescriptions for sorethroat. This has been shown to be effective in studies from Australia and Israel.<sup>19,20</sup> Performance of a throat swab culture to isolate possible GABHS as a basis for antibiotic use appears to be poorly practiced by respondents. Only a tenth of them would take throat swab from patients frequently or occasionally. In the absence of throat culture, the basis for antibiotic therapy becomes unsatisfactory as either judgement is made on clinical evaluation of the patients or an empirical approach is adopted. The implication of this is that physicians are more likely to prescribe antibiotic needlessly to children with non bacterial pharyngitis. The performance of a throat swab, a basic clinical practice was rarely or never done by over a quarter of respondents, limiting these doctors' ground for or against antibiotic use. The reasons for this may range from non availability of examination equipments to lapses from pressure to get done in a busy paediatric out-patient. Furthermore, the results of throat culture where facility avails take two to three days to be received. This requires the patient to make another visit, increasing the cost to the patient which they may not afford. The physicians may find an approach that exclude a throat culture, more cost effective, giving antibiotic presumably to prevent complications. Over time clinical examination of the throat and performance of throat culture may become less important and less frequently done. Parental demand for antibiotics shown in other studies<sup>21,22</sup> to influence the rate of antibiotic prescription appears not to play a great role here. This may be because in our environment, patients hardly question the doctor's decision let alone ask for a particular drug.

That almost all paediatricians in the study examined the throats of children with sorethroat, may reflect better practice based on improved knowledge and training. This buttresses the need for continuing medical education for all physicians attending to children to enhance their practices. As has been noted in a previous study,<sup>23</sup> few respondents in this study preferred penicillin the standard recommended antibiotic for streptococcal pharyngitis in comparison to other antibiotics. Clavulated amoxicillin and cefuroxime were the most prescribed drugs in this study. The choice to prescribe these newer drugs may have been influenced by their popularity and physicians estimation of their efficacy against likely pathogens causing pharyngitis. The advantages of the amoxicillin and cefuroxime in GABHS have been established. Amoxycillin a recommended alternative to penicillin V is more efficacious against GABHS than penicillin.<sup>24</sup> Cefuroxime along with other cephalosporins is significantly less likely to cause bacteria failure of GABHS in children with tonsillitis.<sup>25</sup> However in a resource poor setting the low cost of penicillin compared to these other drugs should be a major factor when making a choice of antibiotics.

It is recommended that National guidelines/recommendations on the appropriate use of antibiotics in pharyngitis be established. Also, the awareness of physicians about the guidelines and educating them on the

use is important. This will curb the unnecessary use of antibiotics. There are a lot of non paediatricians and family physicians managing children. Targeted continuing education programmes to enhance their paediatric knowledge and skills will be helpful.

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