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Original Research Article

Knowledge, Attitude and Practices of Parents Regarding Antibiotic use for Upper Respiratory Tract Infections in Children

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Abstract

Upper respiratory tract infections (URTIs) are frequently observed in paediatric populations. Antibiotics are still being prescribed despite the fact that the majority of upper respiratory tract infections (URTIs) are caused by viral pathogens. The utilisation of antibiotics in this context is deemed inappropriate and the superfluous administration of such medications may potentially contribute to or elicit antibiotic resistance. The issue of unwarranted antibiotic utilisation among paediatric populations poses a significant apprehension regarding the emergence of antibiotic resistance within low- and middle-income nations in the process of development. The primary objective of this study is to assess the level of knowledge and attitudes exhibited by parents of paediatric patients with upper respiratory tract infections in relation to the utilisation of antibiotics and their practices in administering antibiotics within a tertiary care hospital situated in Visakhapatnam. The present cross-sectional study was conducted from May 2022 to October 2022, targeting parents with a child under the age of 18 who sought care at the general paediatrics outpatient clinics of the Department of Paediatrics, NRIIMS, located in Visakhapatnam, India.

Keywords: Upper respiratory tract infections, Parents knowledge, Attitude, Practices

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Introduction

Physicians frequently encounter upper respiratory tract infections (URTIs) in children at primary health care centres [1, 2]. These infectious diseases are widely recognised as the primary etiological factor contributing to the high rates of school absenteeism among children and work absenteeism among parents [3]. Moreover, these infectious conditions in paediatric patients impose a significant financial burden on both carers and the healthcare infrastructure [3].

There exist numerous factors contributing to the improper utilisation of antibiotics in paediatric populations. In certain instances, it may be attributed to the presence of a familial infection that ought to have been treated with antibiotics previously. Consequently, when a comparable viral infection arises, it will remain unremedied in the absence of antibiotic intervention [4]. Furthermore, the administration of antibiotics is initiated even in instances where the infection is suspected to be of viral origin, owing to the unfavourable geographical circumstances of the healthcare provider's location, limited availability of medical equipment, apprehension regarding the patient's limited accessibility to medical assistance, or concerns that the ailing child may not be brought in for follow-up care [4]. Moreover, the apathy exhibited by parents in the context of paediatric patients, coupled with the undue influence exerted on paediatricians to prescribe antibiotics, contributes to the inappropriate utilisation of said medications [5]. Consequently, the administration of antibiotics yields limited therapeutic advantages, and may even pose detrimental effects such as adverse reactions and the development of antibiotic resistance [6, 7].

Multiple scholarly investigations have documented the correlation between the utilisation of antibiotics and the emergence of antimicrobial resistance [8]. Nations exhibiting the greatest antibiotic consumption levels are concurrently associated with the highest prevalence rates of antibiotic resistance [9]. Although the majority of upper respiratory tract infections (URTIs) are caused by viral pathogens [10], the prescription of antibiotics for URTIs is a prevalent practice in the field of paediatric medicine. It is plausible that a significant proportion, ranging from 20% to 50%, of antimicrobial utilisation is deemed medically inappropriate within the context

of healthcare [11]. The improper utilisation of antibiotics is the primary factor contributing to the emergence and proliferation of antibiotic resistance [11].

The primary factors influencing the emergence of resistance in paediatric patients are the collaborative efforts of healthcare professionals specialising in paediatrics and the active involvement of parents or guardians. The influence of parental beliefs and expectations plays a significant role in the decision-making process regarding the prescription of antibiotics. When carers experience heightened distress regarding sudden-onset ailments in children, it results in an increased frequency of consultations with paediatric healthcare professionals for upper respiratory tract infections (URTIs) and, consequently, unwarranted utilisation of antibiotics [12]. Consequently, a plethora of studies have assessed the variables associated with the excessive utilisation of antibiotics.

These factors encompass the domains of knowledge, attitudes, and beliefs pertaining to antibiotic utilisation [4, 13], behaviours [13], patient treatment satisfaction, patient-doctor communication, and patient encounters with antibiotics [2]. The dissemination of accurate medical information and cultivation of a scholarly mindset regarding antibiotics are crucial elements in promoting rational antibiotic utilisation and consequently mitigating the emergence of antibiotic resistance [14]. Regrettably, the burden placed upon healthcare practitioners to fulfil patients' anticipations is a significant determinant for physicians to prescribe antibiotics for viral upper respiratory tract infections (URTI) [14, 15]. Hence, the understanding, perspective, and behaviour of parents regarding the utilisation of antibiotics in upper respiratory tract infections (URTI) among their offspring holds significant importance [15].

The objective of this study is to assess the level of knowledge and attitudes exhibited by parents of paediatric patients with upper respiratory tract infections in relation to the utilisation of antibiotics, as well as their practices in administering antibiotics. The study will be conducted within a tertiary care hospital located in Visakhapatnam.

Methodology

Study design

Our research is a cross-sectional survey study. The study was conducted from May 2022 to October 2022, targeting parents with a child below 18 years of age who sought care at the general paediatrics outpatient clinics of the Department of Paediatrics, NRIIMS, Visakhapatnam, India.

Questionnaire development

A self-administered survey instrument was formulated in Telugu and English subsequent to a comprehensive review of pertinent literature. The majority of the formulated inquiries were derived from previously published validated research studies conducted in India. These questions were subsequently modified to align with the specific circumstances of the local context, ensuring their relevance and practicality. The survey consists of four primary sections: demographic information pertaining to the participants; and knowledge, attitude, and practice regarding the utilisation of antibiotics. The questionnaire's content validity was ensured through the involvement of a panel of experts specialising in the disciplines of paediatrics, infectious diseases, clinical pharmacy, and biostatistics. The ultimate iteration of the questionnaire underwent refinement and rectification in accordance with the feedback provided by the participants.

The ultimate survey instrument comprised a total of 30 inquiries. The initial nine inquiries pertained to demographic factors such as age, gender, educational attainment, monthly family income, place of residence, number of offspring, and the ages of said children. Parents were instructed to indicate prevalent symptoms for which antibiotics were prescribed to their children. The subsequent inquiries encompassed items pertaining to parental perspectives on antibiotics. The carers were requested to provide potential therapeutic interventions for the management of paediatric upper respiratory tract infections (URTI). Additional inquiries were made regarding the parental perception of the efficacy of antibiotics in alleviating a diverse range of symptoms. Moreover, carers were requested to indicate their anticipations regarding the utilisation of antibiotics in relation to upper respiratory tract infection (URTI) symptoms, and to specify the justifications for antibiotic administration in the absence of medical guidance.

Parents were asked to answer the statements on a 5-point Likert scale (“strongly disagree”, “disagree”, “uncertain”, “agree”, “strongly agree” or “never”, “rarely”, “sometimes”, “often”, “always”).

Statistical Analysis

Data were entered and assessed with the Statistical Package for the Social Sciences (SPSS), version 16.0 for Windows. The analysis of answers for questions involved descriptive quantitative statistics, e.g., frequency and percentage for categorical variables and means ± standard deviation (SD) or medians (lower upper quartiles) for numerical variables. The figures were created using Microsoft® Office Excel 2007.

Results

A total of 185 questionnaires were successfully retrieved from the initial distribution of 400, resulting in a response rate of 46.25%. The majority

of participants (76.22%) were female individuals who had given birth, and the age distribution of the participants (71.2%) predominantly fell within the range of 30 to 44 years. A total of 21.08% of the parental population possessed a university degree. A majority of the participants (52.97%) resided in urban areas, while approximately 49.73% of them reported an income level ranging from Rs 50000 to Rs 250000. Approximately 50.81% of the parental population exhibited a uniparous status, indicating the presence of a solitary offspring. Furthermore, a notable proportion of parents, specifically 40.54%, reported abstaining from antibiotic usage within the preceding year. Table 1 presents the socio-demographic characteristics of the respondents.

Table 1: Social demographics of respondents

Variable	Frequency	Percentage
Gender		
Male	44	23.78
Female	141	76.22
Educational level		
Postgraduate	12	6.49
Graduate	39	21.08
Intermediate or Diploma	20	10.81
Secondary School	81	43.78
Primary School	27	14.59
Illiterate	6	3.24
Income Rate		
< Rs 50000	70	37.84
Rs 50000- Rs 250000	92	49.73
> Rs 250000	23	12.43
Residency		
Urban	98	52.97
Rural	87	47.03
Number of children		
1	94	50.81
2	53	28.65
≥ 3	38	20.54
Ages of children		
<1	23	12.43
1-6	84	45.41
7-11	46	24.86
12-14	17	9.19
15-17	15	8.12
No. of antibiotics used		
0	75	40.54
1	50	27.03
2	26	14.05
3	13	7.03
≥4	11	5.95

Table 2 presents the findings pertaining to participants' knowledge-based responses. A cumulative percentage of 23.24% of parental respondents expressed their willingness to administer antibiotics to their children in the event of pyrexia.

A total of 36.75% of the surveyed parents expressed the belief that the administration of antibiotics at an early stage could potentially reduce the severity of upper respiratory tract infections (URTI). A total of 34.59% of respondents expressed agreement with the notion of utilising antibiotics as a preventive measure prior to falling ill, while 11.89% held the belief that administering antibiotics would expedite their child's recovery. A total of 11.35% of the parental population expressed the belief that antibiotics do not exhibit any adverse effects, while 7.03% held the perception that the impact of

antibiotics would intensify in tandem with an increase in their cost. Among the cohort of parents surveyed, it was observed that 25.95% held the belief that the utilisation of inappropriate antibiotics would not exert any influence on the efficacy and resistance of the treatment. Conversely, 33.53% of the participants expressed the view that novel antibiotics could be consistently developed over time.

Table 2: Parental knowledge regarding antibiotic usage

Variables	Item	Frequency	Percentage
Most URTI do not need antibiotic treatment as they are self-limited	Strongly disagree	62	33.51
	Disagree	47	25.41
	Uncertain	33	17.84
	Agree	27	14.59
	Strongly Agree	16	8.65
Antibiotics can decrease severity of URTI if started early	Strongly Disagree	22	11.89
	Disagree	29	15.68
	Uncertain	66	35.68
	Agree	63	34.05
	Strongly Agree	5	2.70
Antibiotics need to be started if child suffers from high fever	Strongly Disagree	17	9.19
	Disagree	63	34.05
	Uncertain	41	22.16
	Agree	55	29.73
	Strongly Agree	9	4.86
There are not much side effects with antibiotics	Strongly Disagree	64	34.59
	Disagree	69	37.30
	Uncertain	31	16.76
	Agree	13	7.03
	Strongly Agree	8	4.32
Antibiotics with higher prices are more effective	Strongly Disagree	78	42.16
	Disagree	63	34.05
	Uncertain	31	16.76
	Agree	10	5.41
	Strongly Agree	3	1.62
Children with URTI symptoms have faster recovery with antibiotics	Strongly Disagree	76	41.08
	Disagree	58	31.35
	Uncertain	29	15.66
	Agree	13	7.03
	Strongly Agree	9	4.86
Bacteria may develop resistance and antibiotics become ineffective due to their inappropriate use	Strongly Disagree	31	16.76
	Disagree	51	27.57
	Uncertain	55	29.73
	Agree	36	19.46
	Strongly Agree	12	6.49
Scientists can always produce newer antibiotics against resistant bacteria	Strongly Disagree	19	10.27
	Disagree	31	16.76
	Uncertain	73	39.46
	Agree	52	28.12
	Strongly Agree	10	5.41

Table 3 presents the findings pertaining to participants' attitude-based responses. In case of fever, ear pain, cough, sore throat, and runny nose, 60% parents agree that they would visit the doctor while 22.17% did not agree to visit the doctor.

A significant proportion of parental respondents (60%) expressed their belief that there is no misuse of antibiotics in children for URTI. A significant majority of the respondents, specifically 52.43%, expressed their belief that it is imperative for both parents and doctors to possess adequate knowledge regarding the appropriate utilisation of antibiotics. The relationship between attitudes towards antibiotic utilisation and various demographic factors was examined in this study. Specifically, education level ($p < 0.001$), areas of residence ($p=0.014$), income level ($p < 0.001$), number of children ($p=0.037$), and age of children ($p=0.009$)

were found to have significant associations with antibiotic use attitudes. Individuals residing in urban areas, possessing a higher level of education, exhibiting a higher income level, having a specific number of offspring, particularly those with younger children, demonstrated more favourable attitudes compared to individuals residing in rural areas, possessing a lower level of education, lower income, a larger number of children, and older children.

Table 3: Parental attitudes regarding antibiotic usage

Variables	Item	Frequency	Percentage
You would visit doctor when your child suffers from symptoms of URTI like cold, cough and fever	Strongly Disagree	12	6.49
	Disagree	29	15.68
	Uncertain	33	17.84
	Agree	86	46.49
	Strongly Agree	25	13.51
Doctor's consultation is needed to prevent complications of URTI	Strongly Disagree	13	7.03
	Disagree	21	11.35
	Uncertain	29	15.68
	Agree	90	48.65
	Strongly Agree	32	17.29
URTI do not resolve completely without antibiotic use	Strongly Disagree	20	10.81
	Disagree	29	15.68
	Uncertain	35	18.92
	Agree	83	44.86
	Strongly Agree	18	9.73
Antibiotics are often misused in children for URTI	Strongly Disagree	25	13.51
	Disagree	86	46.49
	Uncertain	33	17.84
	Agree	29	15.68
	Strongly Agree	12	6.49
You would like to change your doctor for not prescribing antibiotics	Strongly Disagree	15	8.12
	Disagree	28	15.14
	Uncertain	35	18.92
	Agree	84	45.41
	Strongly Agree	23	12.43
Parents and doctors need to be more judicious about use of antibiotics	Strongly Disagree	39	21.08
	Disagree	33	17.84
	Uncertain	16	8.65
	Agree	77	41.62
	Strongly Agree	20	10.81

Table 4 presents the findings pertaining to participants' practice-based responses.35.67% of parents reported abstaining from requesting antibiotic prescriptions from their paediatricians, whereas a 48.11% of parents exerted pressure on their paediatricians to obtain prescriptions for antibiotics. Approximately 54.59% of parents reported that they stopped giving antibiotics to their child without completing the prescribed course in case of recovery while 34.05% parents did not do so. 55.67% of parents asserted that they use the same previously prescribed medicines when similar URTI symptoms come up in the children, while 36.22% of parents did not do so.

Table 4: Parental practices regarding antibiotic usage

Variables	Item	Frequency	Percentage
I used antibiotics without prescription, when my child had fever in the past	Never	25	13.51
	Rarely	31	16.76
	Sometimes	33	17.84
	Often	43	23.24
	Always	53	28.65
I compelled my doctor to prescribe antibiotics when my child had URTI.	Never	23	12.43
	Rarely	43	23.24
	Sometimes	30	16.22
	Often	55	29.73
	Always	34	18.38
Your doctor clearly explains the need for antibiotics when prescribed	Never	17	9.19
	Rarely	16	8.65
	Sometimes	19	10.27
	Often	93	50.27
	Always	41	22.16
I stop giving antibiotic without completing the prescribed course, when the child starts recovering	Never	23	12.43
	Rarely	40	21.62
	Sometimes	21	11.35
	Often	58	31.35
	Always	43	23.24
I preserve and reuse the reconstituted antibiotic till the expiry date	Never	28	15.14
	Rarely	51	27.57
	Sometimes	21	11.35
	Often	53	28.64
	Always	32	17.30
I use the previously prescribed antibiotic when similar URTI symptoms present, without any doctor consultation	Never	34	18.38
	Rarely	33	17.84
	Sometimes	15	8.12
	Often	80	43.24
	Always	23	12.43

Discussion

In our research, we assessed the knowledge and attitudes of parents of paediatric patients with upper respiratory tract infections concerning antibiotic utilisation, as well as their practices in administering antibiotics. This study was conducted in Visakhapatnam. This study represents a comprehensive and up-to-date investigation on the subject matter in Visakhapatnam.

Our research findings indicate that parental attitudes and behaviours towards antibiotic usage are generally positive and aligned with recommended medical practices. A cumulative percentage of 36.75% of parental respondents expressed their concurrence with the administration of antibiotics in the case of any child presenting with fever. The prevalence of concurrence with this assertion was 72.4% as reported in a research conducted in Jordan [14], whereas it was observed to be less than 10% in the investigation carried out in Greece [16]. In a medical research conducted in Italy, a significant proportion of respondents (92.9%) demonstrated awareness regarding the absence of direct antipyretic effects of antibiotics [17].

A consensus of 37% of parents concurred that antibiotics may be employed in the therapeutic management of viral-induced infections. In a study conducted, it was found that 59% of Palestinian parents and 17.2% of Croatian parents expressed agreement with the aforementioned concept. Conversely, Greek parents held the belief that 80% of viral infections exhibited spontaneous limitation and did not necessitate the use of antibiotics [5, 16, 18]. The percentage of individuals who concurred with the proposition of employing antibiotics as a preventive measure prior to the onset of illness amounted to 7.3%. This was also a significantly reduced rate. The recommended frequency of administration, as accurately described by 83.8% of participants, is three times per day, with each dose being administered at intervals of approximately 8 hours. In contrast, Rowa J et al. [19] in their study delineated merely 28% as "every 8 hours" and 56% as "corresponding to the principal meals." In our research, it was found that carers held the perception that fever was the paramount symptom warranting

medical consultation for their offspring, leading them to seek paediatric care. Parents from Jordan, Palestine, and Malaysia [5, 14, 20] concurred with this perspective, whereas parents in Greece and Minnesota exhibited the expectation of antibiotic prescription for otalgia [14, 21].

In our research, it was observed that individuals of the female gender exhibited a higher level of knowledge and adherence to recommended practices compared to individuals of the male gender. Nevertheless, this observation could potentially be attributed to the substantial representation of the female demographic within the study cohort.

In our research, the comparison between female and male genders, individuals with a higher level of education compared to those with a lower level, individuals with a higher income level compared to those with a lower income, and individuals who have used a limited number of antibiotics in the past year compared to those who have used a substantial number, demonstrated a superior level of knowledge. In the research conducted by Al Saleh et al. [22], it was observed that individuals of the female gender, with a higher level of education, and unexpectedly lower income levels exhibited a positive correlation with a heightened level of knowledge. Individuals with a higher level of education residing in urban areas, possessing a higher income, and having fewer children were found to exhibit a more favourable attitude level. Additionally, younger children were found to be associated with a better attitude level. Conversely, Al Saleh et al. [22] discovered that individuals with a higher income and more than three children displayed higher levels of attitude. In our research, the association between female gender and male gender, higher income level and low income level, as well as the disparity in the number of antibiotics used in the last 1 year, were examined in relation to better practice. Hernandez et al. [23] demonstrated in a comprehensive multivariable analysis that the educational attainment level and the limited utilisation of antibiotics within a one-year timeframe exhibited a significant correlation with enhanced cognitive understanding and improved behavioural patterns.

Conclusion

Based on the findings of our research on parental awareness regarding antibiotics in Visakhapatnam, it is evident that, on the whole, parents exhibit appropriate attitudes and behaviours. The findings indicate that certain limitations implemented by the National Action Plan are exhibiting partial efficacy. One of the limitations pertains to the exclusive prescription of antibiotics by medical professionals and their sale solely in licenced pharmacies. This constraint serves to curtail self-administration without a valid prescription and subsequently diminishes the overall consumption of antibiotics. Nonetheless, it remains imperative to ensure that parents, paediatricians, and chemists are apprised of the utilisation of antimicrobial agents, while exercising heightened caution in the process of prescribing such medications. In the event that it becomes indispensable, the implementation of punitive measures by the governing body should be considered as a deterrent against unwarranted antibiotic prescriptions.

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