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A KAP STUDY OF PARENTS ON ANTIBIOTIC USE AND MISUSE IN CHILDREN WITH UPPER RESPIRATORY TRACT INFECTIONS IN CHENNAI

Pharmacology

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ABSTRACT

Upper respiratory tract infections (URTIs) are common in children and represent an important cause of antibiotic abuse which causes antibiotic resistance. A survey was conducted in Chennai to assess parents' and pediatricians' Knowledge, Attitude and Practices (KAP) concerning the role of antibiotics in children with URTIs. A KAP questionnaire was designed and distributed to the school students. A different questionnaire was distributed to the doctors. Demographic factors associated with antibiotic misuse were statistically analysed. The parental overall response rate was 70.8%. Parents (N = 502) follow pediatricians advice and rarely administer antibiotics acquired over the counter. But one third expects an antibiotic prescription for URTI symptoms. Low parental education was the most important independent risk factor . Pediatricians (N = 23) denied prescribing antibiotics after parental pressure but admit that parents ask for antibiotics and believe they expect antibiotic prescriptions even when not required.

KEYWORDS

KAP study; knowledge; attitudes; practices; antibiotic overuse; antibiotic misuse; questionnaire; parents

Introduction

The emergence of bacterial strains resistant to antimicrobial agents presents a growing concern worldwide [1]. The relationship between antibiotic use and resistance development is strong and supported by several studies [2,3]. Countries with the highest per capita antibiotic consumption have the highest prevalence of resistant pathogens [4,5]. Antibiotics are often used for the treatment of upper respiratory tract infections, including sore throat, common cold and rhinitis, even though viruses cause most of these illnesses [6]. Antibiotics abuse in upper respiratory tract infections (URTIs) in children is an important factor contributing to the development of antibiotic resistance and therefore the judicious use of antibiotics in pediatric clinical practice is crucial [7]. It has been estimated that 20–50% of all antimicrobial use is inappropriate [8]. Factors leading to antimicrobial overuse in children are complex, involving, among other factors, parental knowledge and attitude, physician beliefs as well as constraints of daily practice [8-11].

Although a slight decrease has been observed on beta-lactam antibiotic consumption over the recent years, a worrisome increase in the quinolone consumption has been recorded [12].

As no similar literature exists from this country, this study aims to explore the parental knowledge, attitudes and practices (KAP) regarding antibiotic use for children 4–7 years old. Moreover, to investigate primary care physicians' view on this subject, paediatricians practicing at the same areas were asked to fill another KAP questionnaire. This survey is the first part of a national intervention program aiming to monitor and reduce antibiotic misuse in children.

Study methodology

The study was carried out at mogappair in chennai in june 2017 to August 2017.A school based stratified geographic clustering sampling was used to select a representative sample of children 4–7 years old. The list of all kindergarten and elementary students were collected. Two schools were selected in the area which included age, gender and socioeconomic status of the participants. All parents of children attending the kindergartens and elementary schools were asked to participate. In a second sub-study, we included 23 pediatricians practicing in this area and asked them to complete a specially designed KAP questionnaire addressing antibiotic consumption in children with URTIs.

After proper permission from school authority, the questionnaire was distributed by teachers to all children attending the schools. In order to increase compliance, all teachers where personally informed by the researcher about the study and its importance. They were asked to distribute the questionnaires to their students, collect and mail them back to the researcher. With each questionnaire, a formal note addressing the parents, explaining the importance of the subject and their co-operation was handed out.

The KAP-questionnaire, included demographic data and was structured in three main sections which displayed the Knowledge (Section A), Attitudes (Section B) and Practices (Section C) of parents regarding antibiotics use in upper respiratory track infections (URTI) of their children. Demographic data included age, gender, socioeconomic, educational and health insurance status. Section A included questions regarding parental knowledge concerning antibiotics. They were asked to mark antibiotic names out of ten commonly used medications and to answer questions relevant to antibiotics indications, side effects and their use in viral infections. Section B studied the parental attitudes regarding URTIs, antimicr obial agents' use and the pediatricians' role. Parents where asked which symptoms and what duration would lead them to seek medical attention for their children, as well as their expectations regarding antibiotics prescription. Other questions included reasons for antibiotic use without medical advice (over the counter acquisition of antibiotic, use of leftover antibiotic from previous illness, etc.) or whether they would seek for a pediatrician who is more lenient with antibiotic administration.

Finally, section C looked into parental practices and whether the parent-doctor relation is influenced by the latter's attitude on antibiotic prescription. Parents were asked whether their pediatrician spends enough time explaining the illness and suggested antibiotic treatment for their child, whether he is influenced by their demand to prescribe antibiotics, as well as whether their pediatrician gives them instructions over the phone (without previous examination) for antibiotic administration to their sick child.

Each question (apart from those included in the demographic data section) was in a format of five possible answers (accepting only one right answer), according to the 5-point Likert scale: 1 = strongly agree, 2 = agree, 3 = uncertain, 4 = disagree and 5 = disagree strongly or 1 = always, 2 = most of the times, 3 = often, 4 = sometimes and 5 = never.

To verify parent's responses consistency and exclude random completion, three couples of similar questions (where each couple included the same statement expressed in a different way) and three pairs of contradictory questions (where each question included the reverse statement requiring the opposite answer) were entered in the questionnaire's structure. All these questions were randomly placed in the questionnaire to minimize parents' awareness. Questionnaires with discordant responses to two or more of these paired questions were removed.

To further analyze demographic factors associated with antibiotic misuse logistic regression analysis was applied.

Table 1. Questions selected for the logistic regression analysis by section.

Section A (knowledge)	G1 G2	Q16) Parents who have recognized none or only 1 out of 4 common commercial names of antibiotics Q17) Antibiotic should be administered in any case, once a child has fever. Q18) As most of the Upper Respiratory Tract Infections (like cold, flu, sore throat, ear infection) are of viral cause, they should not be treated with antibiotics. Q19) If a child suffers from flu or cold, resolution of symptoms will be quicker if antibiotic is given on time. Q22) When antibiotics are administered for no special reason, their efficacy is decreased and bacteria become more resistant.
Section B (attitudes)	G3 G4 G5	Q27) How often would you like your pediatrician to perscribe antibiotics for your child when it suffers from cold, ear pain, sore throat, cough, vomit, fever, runny nose? Q28) How often would you give your child antibiotics without previous pediatricians' consult? Q30) Would you change your pediatrician because according to your opinion he/she does not prescribe antibiotics often enough for your child? Q31) Would you change your pediatrician because according to your opinion he/she prescribes antibiotics for your child very often? Q32) Would you reuse an antibiotic which you had used in the past if your child presents similar symptoms? Q34) Do you think that most of the Upper Respiratory Infections will be self—cured even without the use of antibiotics?
Section C (practices)	G6	Q42) Would you be unhappy if your pediatrician does not prescribe an antibiotic for your child's Upper Respiratory Infection? Q45) How often does your pediatrician recommend antibiotic therapy over the phone? Q46) In case you strongly wish your child to receive antibiotics, how often do you directly request it?

Six groups of questions (G1–G6), best predicting antibiotic misuse were selected as shown in Table .

A second questionnaire, distributed to pediatricians, included nameless demographics, data concerning the level of postgraduate studies as well as three sections referring to their Knowledge, Attitudes and Practices regarding antibiotic prescription to children with URTIs. This questionnaire has not been pre-tested, had similar format to the parental one but did not include similar-contradictory questions. To increase information accuracy questionnaires were anonymous and utmost care was taken during collection to prevent accidental identification.

Analysis and Results

The data were tabulated and statistically analyzed. More specifically, the possible answers "strongly agree" and "agree" were considered as a "positive" answer, while the possible answers "disagree" and "strongly disagree" were considered as a "negative" answer. The possible answer "uncertain" was not taken into consideration. Similarly, the possible answers "always", "most of the times" were considered as "frequently", while the possible answers "sometimes" and "never" were considered as "rarely". The possible answer "often" was not taken into consideration. Univariate analysis was used to identify risk factors associated to injudicious antibiotic use. Chi-square test or Fisher's exact test were used for qualitative data. Relative Risk (RR) and its 95% Confidence Interval were calculated as well. Statistically significant factors were included in a conditional backward logistic regression model. A p- value < 0.05 was considered statistically significant.

Overall, 714 questionnaires were distributed. The overall response rate was 70.3% (502/714.Forty were excluded from further analysis since parents had contradictory responses to few questions.

The demographic data are shown in the table 2 as follows:

	School 1(N = 376)	**School 2(N = 126)**	***p*-value**
	n/Total (%)	n/Total (%)	
Mother responding (%)	(78.9)	(77.2)	0.418
Median age (years) (IQR)	(33–40)	(32–39)	<0.001
Having insurance (%)	(59.5)	(61.9)	0.355
Having private insurance	(81.9)	(82.7)	0.743
College/University maternal education (%)	(36.9)	(41.8)	0.055
College/University paternal education (%)	(34.8)	(37.4)	0.301
High monthly income (%)	(85.7)	(85.6)	0.929
Foreign born (%)	(3.5)	(7.3)	0.001
Urban residence (%)	(68.3)	(89.5)	<0.001
One child (%)	(9.2)	(14.3)	<0.001
Single parent family (%)	(9.3)	(7.7)	0.276
Child with recurrent URI's (%)	(11.7)	(10.9)	0.631
Good access to healthcare system (%) #	(95,6)	(94.9)	0.578
Consider pediatrician relative/friend (%) #	(38.5)	(35.4)	0.230

Section A (knowledge)

Most parents (90%) affirmed that their pediatrician was the main source for information regarding antibiotics, while television (15.3%) and newspaper (11.6%) followed. However, 3.1% of parents declared they had never received any information. Out of ten commonly used medications, most parents (64%) were able to identify 3/5 antibiotic names.

Although the majority of parents acknowledged that antibiotics have side effects (93%), agreed that misuse reduces their efficiency and increases bacteria resistance (90%), that viral URTI's are self limited (60%) and that fever is not an indication for the administration of antibiotics (87%), many (48.4%) believed that antibiotics may decrease duration of URTI symptoms. Interestingly, most parents (85%) believed that scientists continuously discover new antimicrobial agents against resistant microorganisms and that antibiotics may decrease the incidence of URTI complications (73.5%).

Section B (Attitudes)

Most parents stated that they would seek medical advice for their children, after 2 days of upper respiratory tract infection symptoms. The main symptoms considered important and would drive parents to the doctor's office included earache (84%) and fever (81%), followed by sore throat (45%), cough (36%) and altered behavior (33%). Many parents (33.5%) acknowledged that they expect from their pediatrician to prescribe an antibiotic for URTI symptoms rather than nasal normal saline (30%), mefenamic acid (11%) and paracetamol (33%). We asked parents if they believed that antibiotics were helpful in treating a variety of symptoms. Although very few parents would ask for antibiotics for URTI symptoms (10%), cough (13%) or vomiting (11%), many would expect their pediatrician to prescribe an antibiotic if their child had earache (51%), fever (41%), or sore throat (27%). Interestingly, parents denied that they would purchase antibiotics over the counter without consulting the pediatrician but 6% admitted they would do so if their doctor had previously prescribed an antibiotic for similar symptoms.

The majority of parents (81%) concurred that antibiotics are excessively used without appropriate indications and declared that they would not change pediatrician if he/she didn't prescribe easily antibiotics (95.5%), while they affirmed they would change their doctor because she/he prescribed easily antibiotics (66.5%).

According to 88% of parents, their concern regarding secondary complications of upper respiratory tract infections would lead them to

seek medical advice, while 60% agree that it is best to avoid the use of antibiotics for uncomplicated URTIs. Finally, the vast majority of parents (98%) agree that education of both parents and pediatricians on the judicious use of antibiotics is necessary.

Section C (Practices)

Few parents (9%) admitted that they were left discontent from their pediatrician whenever he/she didn't prescribe antibiotics. However, only 59% would query their pediatrician whether it was really necessary in case he/she would give them a prescription or would praise their doctor when he/she elected not to administer antibiotics. In another question, the majority of parents (90%) stated that the side effects of antimicrobial use are important. Very few parents admitted that they would request antibiotics openly (8.5%) or when diagnosis is not certain (6.5%) or over the phone without a preceding office visit (9%), while very few (4.5%) believe that their pediatrician prescribed antibiotics just because parents asked for them. A significant proportion of parents (90%) believe they have been well informed on the judicious use of antibiotics, admit their doctor has spent time explaining the child's disease and whether he should or not administer antibiotics and more importantly, 97% stated they precisely follow pediatricians' instructions.

Pediatricians' result analysis

Although most pediatricians (>97%) agreed that URTIs are self limited and antibiotic misuse increases antibiotic resistance, 60% agreed that most pediatricians would administer antibiotics for URTIs under parental pressure. Furthermore, although most pediatricians denied they would ever prescribe antibiotics to please the parents, to avoid parents seeking medical help from another pediatrician or because parents insisted, almost 25% would prescribe antibiotics whenever fever persisted for more than 3 days and 15% would do so if the family was leaving on vacation. While all denied administration of antibiotics for common cold or runny nose, 18% and 49% would prescribe antibiotics for croup and otitis with effusion, respectively. While less than 40% reported they believe that parents would appreciate their withholding antibiotics for URTI, more than two thirds reported that they feel that parents want them to administer antibiotics even when their use is not medically necessary. Finally more than 60% reported that parents regularly ask for antibiotics for URTIs.

Discussion

This is a cross-sectional study done with the overall response rate was 69.3%.This methodology was preferred since direct parental interviewing might both involve interviewees' influence as well as interviewers' bias in the interpretation of parental answer. Additionally, in order to interview a large cohort of parents, a large number of interviewers would have to be trained to be sent to interview the parents, which was impractical. Finally, the variability among the interviewers could not be excluded. Using the self-answered methodology however, each responder received the same set of questions phrased inexactly the same way, so the answers were derived in a more objective way. Distribution of the questionnaires by teachers and including a letter explaining the importance of the study probably increased parents' compliance. This study indicates that school based sampling is helpful and achieves high response rates when compared to randomly sending questionnaires to parents by mail [13].

In a recent study, it was shown that a significant proportion of antibiotic outpatient consumption is secondary to over the counter purchase, while in another study involving pharmacists it was depicted that over the counter purchase of antibiotics is easy [14, 15].

Conclusion :

This study indicates that in Chennai, parents are satisfied by the care provided and recognize their pediatricians as their main source of information. Although, it appears that antibiotic misuse is not driven by parental pressure, pediatricians' view implies that medical doctors feel that the majority of parents wish for antibiotic administration for their children's URTIs. It is therefore concluded that simultaneous well structured interventions towards both pediatricians and parents are needed to improve antibiotic consumption.

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