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## The knowledge and expectations of parents about the role of antibiotic treatment in upper respiratory tract infection – a survey among parents attending the primary physician with their sick child

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### Abstract

**Background:** Upper respiratory tract infections (URTI) are common. The etiologic factor is usually viral, but many physicians prescribe antibiotics. We aimed to evaluate parents' expectations of and knowledge about the role of antibiotics in childhood URTI.

**Methods:** The study was conducted in thirteen primary care pediatric clinics. Parents of children aged 3 months to 6 years who attended with URTI symptoms were included when it was the first attendance in the current illness. Questionnaire about the current illness, reasons for attending and expectations from the visit, knowledge about URTI was filled before the visit.

**Results:** In 122 visits the average age was  $2.8 \pm 1.9$  years. The main reasons for the visit were to avoid complications (81%) and to be examined (78%). Expected treatment was: cough suppressants (64%), anti-congestants (57%), paracetamol (56%), natural remedies (53%) and antibiotics (25%). In 28% the child had received antibiotics in past URTI. Only 37% thought that antibiotics would not help in URTI and 27% knew that URTI is a self-limited disease. 61% knew that URTI is a viral disease. Younger parental age and higher education were associated with lower expectations to receive antibiotics ( $p = 0.01$ ,  $p < 0.005$  respectively). While previous antibiotic treatment ( $p < 0.001$ ), past perceived complications ( $p = 0.05$ ) and the thought that antibiotics help in URTI ( $p < 0.001$ ) were associated with a greater expectation for antibiotics.

**Conclusions:** A quarter of the parents attending the physician with URTI are expecting to get antibiotics. Predictors were lower education, older parental age, receiving antibiotics in the past and the belief that antibiotics help in URTI.

### Background

Patients with Upper Respiratory Tract Infection (URTI) constitute a major part of the primary care physician's workload during the winter months [1]. In most cases the etiologic factor is viral and there is no need for antibiotic

treatment [2,3]. Many physicians continue to prescribe antibiotic treatment for URTI, knowing that antibiotics do not help viral infection and despite the development of resistant bacterial strains.

The factors that influence physicians decision to prescribe antibiotics for URTI are: suspected bacterial disease, the fear that a viral infection will lead to a secondary bacterial infection and doctors' belief that the patient expects to receive antibiotics for his illness [4].

URTI is the most common infectious disease in children, with five to eight episodes each year [1]. Previous studies in the USA and UK had shown that more than 30% of parents expected their child with URTI to receive antibiotic treatment at the first visit to the pediatrician [5,6]. Mangione-Smith et al noted that fifty percent of parents expressed a pre-visit expectation for antibiotics [7]. The reasons were: the fear of a severe illness which requires antibiotic treatment, the belief that antibiotics are the treatment of choice for URTI, relieve symptoms and shorten the duration of the disease [5]. Parental expectation to receive antibiotics was found to be a major factor influencing the overuse of antibiotics [8]. Mangione-Smith et al noted that physicians' perceptions of parental expectations for antibiotics was the only significant predictor of actual prescribing of antibiotics for conditions of presumed viral etiology [9]. When physicians thought a parent wanted antibiotics, they prescribed them 62% of the time versus 7% of the time when they did not think the parent wanted antibiotics. In addition, when physicians thought the parent wanted an antimicrobial, they were also significantly more likely to give a bacterial diagnosis (70% of the time versus 31% of the time).

Using clinical vignettes, Schwartz et al [10] found that the main reasons given for prompt antibiotic therapy for purulent rhinitis were [1] the belief that many untreated patients would develop persistent purulent nasal drainage, [2] concern that acute otitis media would develop, [3] pressure from mothers to prescribe an antibiotic and/or [4] the desire to allow employed parents to return to work earlier.

Stivers et al revealed an incongruity between parents' reported expectations, their communication behaviors, and physicians' perceptions of parents' expectations [11]. Though it seems that physicians act according to parents' expectations by prescribing antibiotic treatment, it does not influence parents' satisfaction from the encounter [12]. Spending more time in explaining the nature of the disease and reassuring that it's not a severe one seem to be much more important [4,13]. Parents indicated that they would be satisfied with the medical visit even if antibiotics were not prescribed, provided the physician explained the reasons for the decision [8].

Following a public campaign in Israel against antibiotic use in URTI we aimed to evaluate parents' expectations,

beliefs and knowledge about the role of antibiotics in childhood URTI.

## Methods

The study was conducted in thirteen urban primary care pediatric clinics in the winter of 2000/2001. It followed a public campaign against antibiotic use in URTI that took place that winter. The campaign used the public media (written and electronic) as well as pamphlets and posters in primary care clinics. It was focused mainly on two items: URTI is a viral disease and antibiotics are not the solution. In Israel most of the children in the urban setting are being treated by pediatricians and only in rural regions by a general practitioner. In each clinic ten suitable consecutive cases were enrolled by a family practice resident (not working in the same clinic). The residents recruited participants by contacting the parents of children aged 3 months to 6 years in the waiting room according to the appointments list. Children presented with URTI symptoms (nasal congestion, cough, fever and sore throat) were included, only if it was their first attendance in the current illness.

Visits due to fever lasting more than 7 days, chronic diseases, other symptoms such as earache, or children who came without one of their parents were excluded from the study.

The parents filled in a questionnaire, which was handed out by before entering the physicians' office. The resident was available to answer any questions or misunderstandings.

The questionnaire included three parts:

The first part included demographic data about the child and parents, parents' occupation and educational background, and the caregiver who takes care of the child during health and illness.

The second part inquired about the current illness: duration of symptoms, severity of illness in parents' view, symptoms, reasons for current visit and data about past antibiotic treatment.

In the third part we asked about parents' knowledge and health beliefs -

What is the treatment of choice for the current illness?

Does antibiotic treatment help?

Do you think that URTI is a self-limited disease?

**Table 1: Socio-demographic data of Parents in 122 visits of children with URTI**

|  |   |
|--|---|
| Escort parent                            | Mother – 82%<br>Father – 18%  |
| Age of parents (years, mean + SD, range) | Escort parent – 30.6 ± 5.5 (20–47)<br>Other parent – 32.8 ± 5.6 (20–50) |
| Occupation – full or part time           | Escort parent 79.6%<br>Other parent 76.7%                               |
| Education (years, <u>mean + SD</u> )     | Escort parent – 14.1+2.4<br>Other parent – 14.3+2.5                     |
| Single parent families                   | 2 (1.6%)  |

**Table 2: Reasons for physician referral and expected treatment by Parents in 122 visits of children with URTI\***

| Reason for referral     | Rate (percent) |
|-------------------------|----------------|
| To avoid complications  | 83%            |
| Just to be checked      | 79%            |
| To get medications      | 54%            |
| Administrative          | 9%             |
| Others                  | 4%             |
| Expected treatment      | Rate (percent) |
| Cough suppressant       | 67%            |
| Anticongestants         | 60%            |
| Paracetamol             | 56%            |
| Alternative medications | 55%            |
| Antibiotics             | 24%            |

\*There can be more than one reason for referral or expected treatment for each visit.

Do you think there could be harm from antibiotic treatment?

What is the etiologic agent of URTI?

Do you think that natural remedies are useful?

**Statistical methods**

parents' answers were entered to an electronic spreadsheet. To compare percentage between two groups we used  $\chi^2$  test. Linear variables were assessed by t-test to compare two groups and by ANOVA for comparison of more than two groups.

**Results**

The study included 122 visits (for a response rate of 93%) from 13 primary care pediatric clinics. The childrens' age ranged from 3 months to 6 years (average 2.8 ± 1.9), 55% were boys. The attending child was the only child in 30% of cases, one of two in 42%, one of three in 19%, and one of four or more in the remaining cases. In 79% of cases the attending child was the youngest in the family. In 81.5% the child attended a day care center.

In 82% of the visits the escorting parent was the mother, table 1 shows the socio-demographic data of the parents. In case of an illness the child would be taken care by one of the parents in 57%, grandparents 13%, parents/grandparents 19% or a nanny 7%.

Symptoms duration of the current illness was less than 24 hours in 47% of cases, and in only 23% lasted more than 4 days. 69% of the parents defined their child's illness as mild.

The symptoms included: rhinorrhea (87%) cough (87%), and fever (64%). Table 2 shows the reasons for the visit and the expected treatment. In 28% of the cases the child received antibiotics in a past URTI and according to their parents 38% had complications after a past URTI. 24% of the parents thought that antibiotic treatment was appropriate for the current illness.

Table 3 shows parents' answers to some factual questions, about antibiotic treatment in URTI.

**Table 3: Parents' answers to some knowledge questions, about antibiotic treatment in 122 visits of children with URTI.**

| Question                             | Rate of "yes" answer (percent) |
|--------------------------------------|--------------------------------|
| Antibiotics don't help in URTI       | 37%                            |
| The illness is self-limited          | 28%                            |
| Misuse of antibiotics may cause harm | 78%                            |
| URTI is usually caused by a virus    | 60%                            |
| Alternative medications may help     | 63%                            |

Younger parents had a lower expectation for antibiotic treatment (escort parent age 30.5+5.2 vs. 31.2+6.2, p = NS, other parent age 32.4+5.3 vs. 37.4+7.4 p = 0.01). Higher educated parents had a lower expectation for antibiotic treatment (escort parent years of education 14.5+2.5 vs. 12.8+2.1, p = 0.001, other parent years of education 14.9+2.4 vs. 13.2+2.3 p < 0.005).

There was no association between parental socio-demographic characteristics and other treatments (paracetamol, anticongestants, cough suppressants or natural remedies).

Antibiotic treatment in previous URTIs was associated with a greater expectation for antibiotic treatment (54% of the previously treated expected antibiotics vs. 19% among previously untreated, p < 0.005). The experience of past complications after an URTI was associated with a greater expectation for antibiotic treatment (58% vs. 33%, p = 0.04).

Parents that answered a positive answer to the statement "antibiotics don't help in this kind of an illness" had a lower expectation for antibiotic treatment (43% vs. 15% p = 0.002). Parents that answered a positive answer to the statement "this disease is a self-limited one", had a lower expectation for antibiotic treatment (8% vs. 35%, p = 0.01)

There was no association between expectation to get antibiotics and the statements "antibiotics misuse can cause harm" and "URTI is usually a viral disease".

**Discussion**

Our findings do not support the common belief among physicians, which in cases of URTI parents expect is to receive antibiotic treatment [1]. We found that only 24% of the parents thought that antibiotics are part of the treatment of their sick child, while more than half expected to get symptomatic relief or natural remedies.

Adults expect to get antibiotic treatment for URTI in 50–65% of cases [4,5]. Braun et al [3] reported a lower rate, only 30% while Mangione-Smith et al reported 50%

expectation for antibiotics [7]. It is worth noting that the exclusion of children presenting with ear pain in our study may impact the lower parental expectations for antibiotic treatment we found in comparison with others.

It seems therefore that in cases of URTI the reasons for attending the pediatrician may not be different from those of adult visits [11,12]. Cowan examined URTI patients' expectations from the encounter<sup>5</sup>. She found that the major reason for the visit was to get reassurance that it is not a serious disease. The actual treatment given by the physician did not influence patient satisfaction from the visit and did not reduce the chance of a recurrent visit [4,13]. We found that the major reasons for referral were to be examined by a physician and to prevent future complications, similarly to the findings of Braun et al [5]. Hamms et al [4] noted that listening to the patient and spending time explaining the nature of the disease raises patient satisfaction.

Braun found a correlation between the expectation to get antibiotic treatment and parents' occupation. Parents who worked full time had higher expectation to get antibiotic treatment, maybe assuming that it will shorten disease duration and therefore getting back to work earlier [5]. Such a correlation was not found in our study. It maybe because of greater support from the extended family or the fact that work absence due to child's illness is normative and have a legal basis in labor regulations in Israel.

We found a lower expectation rate for antibiotics among younger parents and among more highly educated. It seems that the campaign held in Israel against the use of antibiotics for URTI had a higher impact on young and educated parents.

The study of Braun et al showed a higher expectation rate for antibiotics in parents who defined their child's illness as serious, felt the disease was lasting too long, or wanted a quick relief of symptoms [5]. In our study most parents defined their child's illness as mild and of short duration in contrast to other studies, this could explain the fact we did not found correlation between expectations for antibi-

otic treatment and these variables. The short duration of illness is with concordance with the highly available primary care service in Israel and the competition between HMOs. Waiting another 2–3 days before a visit would result in resolution of the milder episodes of URTI.

Parents do not expect antibiotic treatment in most cases and physicians know that antibiotics do not help in treating URTI. Why then physicians continue to prescribe antibiotics and how can we lower the antibiotic overuse for URTI? [1,6,14]. It seems that the medical community encourages patients to visit the physician and to expect antibiotic treatment in cases of URTI [15]. Physicians think patients expect to get antibiotic treatment, but this assumption is incorrect in most cases. Physicians cannot predict patients' expectations correctly [1].

Physicians' behavior, in cases of URTI, influences the parents' position. We found that past antibiotic prescription raised expectation for antibiotic treatment in the current visit. That finding was demonstrated in previous works as well [1,16]. There is a need, therefore, to understand physicians' beliefs and behaviors and to find ways to change them. Physicians asserted that their own antibiotic prescribing could be safely reduced [8]. Parental expectation to receive antibiotics was a major factor influencing their overuse of antibiotics [8]. On the other hand Cockburn et al found that although patients brought expectations to the consultation regarding medication, the doctors' opinions about their expectations were the strongest determinants of prescribing [9].

The differences in physician and parent perceptions about antibiotic overuse suggests that educational efforts to narrow this communication gap will be important for improving antibiotic use. Parents perceived as expecting antibiotics may be seeking reassurance that their child is not seriously ill or that they were correct to obtain medical care. Physicians were significantly more likely to perceive parents as expecting antibiotics if they used certain communication behaviors [11]. Further research is needed to better understand physician beliefs and behaviors and ways to change them.

Health beliefs and parents' knowledge regarding URTI influenced their expectation for antibiotic treatment. We found that attitudes such "antibiotics do not help in such illnesses" and "illnesses like this are self limited", were associated with lower expectation for antibiotic treatment. Emphasizing and strengthening these beliefs, as well as explaining the nature of the disease and that antibiotics can cause complications, could contribute to the success of future campaigns. Providing patients and parents with this information will help doctors to give better medical treatment without prescribing unnecessarily antibiotic

treatment for URTI. Further research should focus on evaluation of parents' expectations and effective ways to educate the parent about appropriate use of antibiotics in treatment for URTI.

## Conclusions

A quarter of the parents attending the physician with URTI expected to get antibiotics. Predictors were lower education, older parental age, and receiving antibiotics in the past and the belief that antibiotics help in URTI. It seems that strengthen the positive patient's beliefs and consider intervention to change physicians' prescribing habits may contribute to the reduction of antibiotic use in URTI.

## Competing interests

None declared.

## Authors' contribution

SV conceived and designed the study, participated in the collection, analysis, statistical analysis and interpretation of data and drafted the manuscript. RA participated in the design of the study, analysis and interpretation of data and draft of the manuscript. EK participated in the design of the study and in the collection of data and draft of the manuscript. All authors read and approved the final manuscript.

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