PIDSP Journal, 2002 Vol. 6 No. 3

ANTIMICROBIAL USAGE OF PHYSICIANS IN LAS PIÑAS CITY FOR UPPER RESPIRATORY TRACT INFECTIONS IN CHILDREN AND PARENTS' VIEWS REGARDING THEIR USE

MA. ARLENE T. MARY, MD*, ANNA LENA LOPEZ, MD*

Abstract

Objective: **To determine the prevalence of antibiotic usage among physicians in children with upper respiratory tract infection and parents views regarding the use of antibiotics for the said indication.**

Design: **Cross-Sectional Study.**

Setting: **Private and government outpatient clinics and emergency rooms within Las Piñas City.**

Methods: **Ninety-four (94) self-administered questionnaires were collected out of one-hundred fifteen (115) distributed among pediatricians, general practitioners, family physicians and residents, who are members of the Las Piñas Medical Society. One hundred one (101) parents bringing in their children to physicians in Las Piñas City for upper respiratory tract infection (URTI) were questioned regarding their opinions on antibiotic usage in URTI. Data were analyzed using multivariate analysis.**

Results: **Two-thirds (65%) of the physician respondents acknowledged giving antibiotics which was not warranted at that time and Amoxicillin was the most common antibiotic of choice. 74% of parents will continue to follow-up with their physicians who refuse to prescribe antibiotics as long as the physicians explain the reason for not doing so. 25% of parent respondents expect an antibiotic prescription for children with URTI of which only 10% would directly request for antibiotics. Many physician respondents did not follow the guidelines formulated by the Center for Disease Control (CDC) and American Academy of Pediatrics in all the three scenarios presented. Pediatricians were more likely to perceive that they are giving unwarranted antibiotics than the family physicians and the general practitioner.**

Conclusion: **Emphasis on rational use of antibiotics should always be an integral part of medical practice. Information about available guidelines for judicious antibiotic usage should be disseminated and adopted into routine clinical practice by physicians of various fields and specializations. Parental education regarding appropriate antibiotic usage in URTI will likewise curtail the emergence of antibiotic resistance.**

INTRODUCTION

Respiratory diseases have been shown to be a major cause of morbidity and mortality throughout the world, particularly in the pediatric population. Most children have about 4-6 acute respiratory infections (ARI) each year, about 70% of which are upper respiratory infections (URTI)[1].

Viruses are considered the primary pathogens of URTI, comprising approximately 80% of total URTI cases. Most URTI are therefore mild and self-limited and antibiotics need not be prescribed[2].

Antibiotics are arguably the most important advances in the history of medicine. It may be indiscriminately used for a variety of infections including URTI. However, antibiotic resistance is a growing problem with a variety of pathogens demonstrating resistance as a result of extensive use and abuse of antibiotics[3].

In the study by Pichichero et.al., children with respiratory tract infections without concomitant presumed or proven bacterial infection did not require antibiotics and this reinforces the judicious use of antibiotics in managing children with ARI. Some physicians however, embrace the notion that presumptive antibiotic treatment in URTI will reduce return office visits and prevent subsequent bacterial infections. Others commonly prescribe antibiotics out of concern that the parents will be dissatisfied and thus seek antibiotic treatment elsewhere if their expectations are not met. As a result, recovery from illness leads both parent and physician to attribute improvement (or the absence of development of a secondary bacterial infection) to the antibiotic. This becomes a self-perpetuating cycle of expectation when the child experiences future similar infections[4].

Moreover, several studies have attributed high prescribing rates to parental pressure, patient volume, legal concerns and the physicians' desire to validate the office visit. A recent editorial emphasized on the role of patient expectations in driving inappropriate antimicrobial prescribing and the responsibility of physicians to educate parents about antimicrobial use[5].

Since URTI accounts for much of out-patient antimicrobial prescribing in pediatric use, guidelines as regards the appropriate use of antibiotics for URTI have been formulated by the Center for Disease Control (CDC) and the American Academy of Pediatrics

Keywords: *antimicrobial usage, upper respiratory tract infections*
* University of Perpetual Help Rizal Medical Center

(AAP)[10-12]. This study sought to determine how physicians follow these guidelines for URTI and how parents perceive antimicrobial usage for this indication.

OBJECTIVES

General Objectives: To determine the prevalence of antibiotic usage among physicians in Las Piñas City in children with upper respiratory tract infection and parents views and opinions regarding the use of antibiotics for the said indication.

Specific Objectives:

1. To identify the indications for antimicrobial prescribing by physicians among children with URTI.
2. To determine the association of antibiotic prescribing of physicians as to their:
   a. age
   b. level of training
   c. field of specialization
   d. length of practice
3. To identify the most common antimicrobial of choice prescribed by physicians for URTI.
4. To determine whether parents expectations influence giving of antimicrobials among physicians in children with URTI.
5. To determine parents' views and opinions regarding antibiotic prescription of physicians among children with URTI.

RESEARCH DESIGN: Cross-Sectional Study

METHODOLOGY:

A 19-item questionnaire consisting of three parts was distributed to one-hundred fifteen (115) physicians practicing in the Las Piñas area. Most were members of the Las Piñas Medical Society (LPMS) of which 15% of them were no longer in active practice or were not available in their listed addresses. 33% of the respondents were non-members of the LPMS. Part 1 contained questions regarding the physicians demographic profile, training and clinical experience. Part II consisted of case scenarios commonly seen in private practice. The choices on the cases presented were based on Guidelines on the Principles of Judicious Use of Antimicrobial Agents for Pediatric URTI prepared jointly by the Center for Disease Control and Prevention and the American Academy of Pediatrics[10-12]. Included were questions regarding antibiotic prescription practices of physicians in cases of upper respiratory infections. Part III contained queries regarding physicians' opinions on antibiotic use and resistance. The questionnaire was initially pretested among 5 physicians.

Another questionnaire was presented to parents. One-hundred one (101) parents bringing their children for URTI consultation were sought for interview and all of them agreed. The parents interviewed were randomly selected from those seen at the Medical Arts Building of University of Perpetual Help Rizal Medical Center (43%) and from government-owned clinics (57%). An interviewer-administered questionnaire was used and given by a single interviewer. The parents were asked regarding incidence of URTI among children, parents expectations from their physicians and what they understand about antibiotic usage. Responses were then collated and analyzed using multivariate analysis.

RESULTS

Physicians

Nine-four (94) questionnaires out of one hundred fifteen (115), which were distributed to physicians, were gathered and collected with a response rate of 81.7%.

Table 1. Demographic Characteristics of Physicians included in the study.

Variable	N	Percent
1. Sex		
Male	27	28.72
Female	67	71.28
Total	94	100
2. Age in Years		
25-35	50	53.19
36-45	27	28.72
46-55	12	12.77
56-65	5	5.32
Total	94	100

Table 2. Practice Characteristics and Profile of Physicians in the study.

Variable	N	Percent
1. Field		
General Pediatrics	54	57.45
Family Medicine	11	11.70
General Practitioner	21	22.34
Pedia Subspecialty	8	8.51
2. Training		
Subspecialty	9	12.33
Pediatrics	33	45.20
Family Practice	9	12.33
Resident	22	30.14
3. Year Graduated		
1960-1969	3	3.19
1970-1979	13	13.83
1980-1989	26	27.66
1990-2001	52	55.32
4. Length of Practice		
<5 years	47	50
5-10 years	18	19.15
10-15 years	15	15.96
>20 years	14	14.89
5. No. of cases seen/ month		
5-10	2	2.13
10-15	13	13.83
15-20	10	10.64
>20	69	73.40

The remaining twenty-one (21) questionnaires were either not collected, left unanswered or had incomplete answers.

For the first case in the questionnaire, a child with five-days history of cough productive of whitish to yellowish phlegm and essentially normal physical examination findings, sixty (64%) of the physicians interviewed would prescribe analgesic and/or expectorant. This was followed by twelve (12%) who opted to prescribe antibiotic and mucolytic. The predominant choice of antibiotic was Amoxicillin with Contrimoxazole as the second most common choice. (Table 3).

Table 3. Responses of Physicians on different case scenarios.

Variable	N	Percent
1. Case No. 1		
Expectorant/Mucolytic	60	63.83
Mucolytic & Antibiotic	2	2.13
Antibiotic	10	10.64
Mucolytic & Laboratory	7	7.45
All of the above	6	6.38
None of the above	9	9.57
2. Case No. 2		
Increase oral fluid intake	20	21.28
Antibiotic	7	7.45
Decongestant	1	1.06
All of the above	25	26.60
Docongestant & fluid intake	41	43.61
3. Case No. 3		
Throat Culture	23	24.47
Throat Culture & Antibiotic	9	9.58
Throat Culture & Analgesic	1	1.06
Antibiotic	42	44.68
Antibiotic & Analgesic	3	3.19
Analgesic	3	3.19
Analgesic and wait for throat culture	1	1.06
Wait for throat culture	10	10.64
Other	2	2.13

For the second case presented, that of a 4-year old girl with a 3-day history of clear rhinorrhea which has turned purulent, accompanied by fever for 2 days but had already defervesced, forty-one (43%) of the respondents advised oral fluid intake plus use of decongestant. Twenty-five (27%) however, opted to start an antibiotic along with increasing fluid intake and giving decongestant. Twenty (21%) of physician respondents preferred to only advise increase fluid intake. Amoxicillin remained the most common choice for this case again followed by Cotrimoxazole.

With regard to the third case presented, a 3-year old boy complaining of sore throat, dysphagia and anorexia with noted pharyngeal exudates and palpable cervical lymphadenopathy on physical examination, forty-two (45%) of the respondents answered prescribing antibiotics as their initial management. Twenty-four (24%) on the other hand, would rather request for a throat culture and sensitivity testing while eleven (11%) would wait for throat CS result prior to start of antibiotic. The survey revealed that Amoxicillin was the preferred choice for antibiotic use for this case. Other antibiotics mentioned wer Erythromycin, Co-amoxiclav and Cotrimoxazole.

Majority or almost two-thirds (65%) of the respondents reported having prescribed unwarranted antibiotics for patient with signs and symptoms of URTI while the remaining thirty-three (35%) replied otherwise. Almost 30% of those who prescribed antibiotic with unwarranted use occurred less than once a week. (Table 4)

Table 4. Physicians options regarding Antibiotic usage.

Variable	N	Percent
1. Unwarranted Giving of Antibiotics		
Yes	61	64.89
No	33	35.11
2. Parents' Request for Antibiotic		
Always	1	1.06
Sometimes, if 2° to a bacterial infection	88	93.62
Sometimes, if specifically requested	1	1.06
Never	4	4.26
3. Frequency of Parents' Expectations		
Always	5	5.32
Most of the time	29	30.85
Often	30	31.91
Occasionally	25	26.60
Rarely	5	5.32
*4. Reasons for Antibiotic Prescriptions**		
Suspected Bacterial etiology	87	92.53
Parents' expect for RX	4	4.25
To shorten course of illness	26	27.64
To avoid return visit	9	9.56
To prevent 2° bacterial infection	42	44.67

Table 5. Factors contributing to inappropriate use of Antibiotics according to Physicians

Variable	N	Percent
a. Concern about legal liability	3	3.19
b. Promotion of antimicrobial use	59	62.77
c. Parental Pressure	28	29.79
d. Others	11	11.70
1. self-medication	3	3.19
2. prolonged course/overuse of antibiotics	3	3.19
3. difficulty in differentiating viral from bacterial infection	1	1.01
4. poor compliance	1	1.01
5. false sense of security on the part of MDs	1	1.01
6. lack of parent education	1	1.01
7. shopping for other MDs who would give antibiotics	1	1.01

Interestingly, eighty-eight (94%) of the physicians complied with parents request for antibiotic prescription if they think it is secondary to a bacterial etiology. While four (4%) answered no to parents request for antibiotic prescription. Thirty (32%) replied that this occurred often, twenty-nine (31%) replied that this occurred most of the time, twenty-five (27) replied that this occurred only occasionally. (Table 4).

Eighty-seven (92.5%) of the physicians answered that the likelihood of bacterial etiology is their foremost consideration when prescribing antibiotics for URTI. Forty-two (45%) believe antibiotics would prevent secondary bacterial infection, while twenty-six (28%) thought that antibiotics would shorten the course of illness.

As regards physicians opinion on antimicrobial use, majority of the respondents (78%) strongly agreed that overuse of antibiotics is a major factor contributing to the development of antibiotic resistance. Likewise, fifty (75%) of the respondents agreed that prior antibiotic use increases the risk that the child will develop an infection with a resistant organism followed by 25% of those who strongly agreed, 13% disagreed while 12% answered neutral. Fifty (53%) of the respondents believed that resistance to antimicrobials has resulted in treatment failure for children with URTI in their practice, 17% answered neutral while 16% strongly disagreed.

PARENTS

A total of one-hundred one parents bringing in their children for URTI consultation to out-patient clinics of UPHRMC and local health centers in Las Piñas City were sought for interview and all of them agreed. The following tables show their demographic profile and answers to the interview.

Table 6. Demographic profile of parents interviewed who brought their children to Physician's clinic for URTI

Variable	N	Percent
1. Age		
20-30	33	32.67
31-40	52	51.49
41-50	16	15.84
Total	101	100
2. Educational Attainment		
Primary	5	4.95
Secondary	31	30.69
College	62	61.39
Master's	3	2.95
3. No. of children		
1-3	83	82.18
4-6	15	14.85
>6	3	2.97

Table 7. Patients Illnesses and Consultations

Variable	N	Percent
1. Frequency of illness		
1week	5	4.95
1 month	32	31.68
4 yr.	29	28.71
2 yr.	29	28.71
Other	6	5.95
2. Frequency of bringing children to MD		
Always	39	38.61
Often	34	33.66
Rarely	26	25.75
Never	2	1.98
3. Expectations of patients from MD		
Antibiotic	25	24.75
Cough suppressants/Decongestants	35	34.66
Supportive treatment	40	39.61
Other	5	4.95
4. Matters discussed with MD's		
When antibiotic are necessary	68	67.32
Possible complications	65	64.35
Probable causes	50	59.41
Other	3	2.97
5. Parental requests for antibiotic		
Yes	11	10.89
No	90	89.11
6. Follow-up with MD's		
Yes	75	74.26
No	20	19.80
Maybe	6	5.94
7. Parental understanding about antibiotics		
Should always be given	4	3.96
Only in severe cases	97	96.04
8. Parents' views on antibiotic Administration		
Faster resolution of symptoms	43	42.57
Prevents bacterial complications	47	46.53
Other	11	10.90

DISCUSSION

Emergence of bacterial strains that are resistant to antimicrobial agents is a growing national and worldwide concern[6]. Parental expectations and pressure may influence these patterns[9]. Factors leading to antimicrobial overuse are complex, involving physicians' beliefs, the constraints of daily practice and patient expectations.

The leading cause of antibiotic prescription in the pediatric out-patient setting is URTI, consuming approximately 46 million of antibiotic prescriptions from 1990 to 1992[6]. Therefore, guidelines for appropriate antibiotic usage in URTI have been formulated by the CDC and AAP. In the case scenarios presented in the questionnaire, for cases 1 and 2, antibiotics should not be prescribed based on the CDC and AAP guidelines,

however, we noted that 19% and 34% of the respondents respectively, would prescribe antibiotics. For this case, the guidelines recommend that laboratory tests be performed initially. This is not the usual practice in our country because it entails additional laboratory fees and requires subsequent patient follow-up. Amoxicillin remains to be the antimicrobial of choice in patients with signs and symptoms of URTI. Our study revealed that age, level of training, length of practice and field of training were not associated with the physicians' decision to give antibiotics in all the three case scenarios presented.

In our study, 64% of the physicians had given unwarranted prescriptions of antibiotics among patients with URTI. General pediatricians however, were 3.2 times more likely to perceive that they are giving antibiotics which they do not think was necessary at that time. Although about 92% would prescribe antibiotics for a suspected bacterial etiology, 45% of the physicians would prescribe antibiotics in order to prevent secondary bacterial infection. Although a large majority of physicians realize that antimicrobial therapy will not hasten resolution of URTI, antimicrobials are often prescribed in an attempt to prevent bacterial complications[12-13]. Present data indicate that this is not an effective strategy. A recent metaanalysis of five randomized clinical trials of the efficacy of antimicrobial treatment of URTI to prevent lower respiratory infections found no evidence for a protective effect[14]. Pichichero et.al stated that the rationale for presumptive antibiotic use in respiratory tract infections relates to diagnostic uncertainty. Faced with an ill-appearing, febrile child and anxious parents, physicians are reluctant to offer only symptomatic therapy. If the physician were more certain that their infection was of viral etiology, then a greater comfort level might exist in avoiding antibiotic treatment[4]. This perhaps might explain why our physician respondents are more likely to prescribe antibiotics.

Our study showed that fifty-nine (62.77%) of the physician respondents reported widespread promotion of antibiotic as the foremost reason for inappropriate use of antibiotics while only twenty-eight (29.79%) was due to parental pressure. This differs from studies in the United States wherein parental pressure contributes most to inappropriate antibiotic use[9]. The wide spread promotion of antibiotics should not influence the physicians' judgment whether antibiotics should be prescribed or not. The decision should still depend on their clinical evaluation and laboratory findings, whenever present. This result is indeed alarming and was not seen in studies performed elsewhere. This should make physicians realize the impact of pharmaceutical companies' promotion and how they affect their clinical practice.

Among the parents surveyed, majority of them would not request for antibiotics (90%) however, about 25% expect that they will be given antimicrobial prescription for their children who were brought to the physician with URTI. Ninety-seven (96%) of parent respondents believe that antibiotics should only be given in severe cases and/or unresponsive to supportive treatment. This differs from those cited in other studies regarding unrealistic expectation for antibiotics on the part of the parents[6]. There is no evidence of a significant association between frequency of parental request to physicians' perception that they are prescribing unwarranted antibiotics. Majority of parents bring their children for consult when signs and symptoms of URTI occur. Forty-seven (47%) of the parent respondents believe that antibiotics prevent bacterial complications. In a study by Palmer et. al, 85% of the parent respondents felt that excessive use of antibiotic was associated with development of antibiotic resistance and about one-third of the parents were worried that their children were receiving too many antibiotics[7]. Contrary to the belief that refusal by physicians to prescribe antibiotics would deter subsequent consultations, our study revealed that 74% will continue to follow-up with their physicians as long as the physician takes time to explain the reason for not giving antibiotics on the particular consultation. Thus, parental expectation is determined largely by effective physician-patient communication and not be giving into parental demands of antibiotic prescription.

A study by Bautista and Valdez in an emergency room setting in Metro Manila showed that a significant number of parents surveyed thought that antibiotic is needed for infections caused by viruses. They noted that educational level was significantly associated with responses corresponding to the parents' knowledge and behavior. A person with a college education was more likely to believe that antibiotics would be effective in killing viruses[8]. This was not depicted in our study probably because majority (62%) of parent respondents were college graduates.

Seventy-four (78%) of the physician respondents strongly agreed that the overuse of antibiotics is a major factor contributing to the development of antibiotic resistance. The widespread

use of antimicrobials, whether appropriate or inappropriate, has driven the emergence and spread of resistant organisms[6]. This had led to ongoing programs that aim to improve antimicrobial prescribing patters and promotion of judicious antimicrobial use. The Center for Disease Control (CDC) and the American Academy of Pediatrics (AAP) came out with joint guidelines in antimicrobial prescribing in URTI among pediatric patients. As yet there are no similar guidelines in the Philippine setting for URTI.

Reducing inappropriate prescription has been advocated as one way to protect patients against resistant infections. A worldwide campaign should be undertaken to improve the understanding of microbial resistance to antibiotics not only among physicians but by society as a whole.

CONCLUSION / RECOMMENDATIONS

Majority of the physicians included in the study have prescribed unnecessary antibiotics for patients with URTI in the past and pediatricians were more likely to perceive that they are giving unwarranted antibiotics than the family physicians and the general practitioners.

Our study relied on physician self-reporting. Thus, responses may not be reflective of actual physician prescription practices. Future studies may be performed on out-patient departments reviewing physician's with different age groups, preferably including representative samples from the whole country.

Although foreign guidelines have been available as regards antibiotic usage for patients with URTI, many physicians do not practice these guidelines. Local practice guidelines should be formulated based on available research and epidemiologic data.

Physicians should be reminded of the growing problem of antibiotic resistance, and although there is widespread promotion of antibiotics, physicians should not succumb to this pressure. Intensive physician education on the public health threat of antibiotic resistance among microbes have already been undertaken by the WHO. The general public should likewise be cognizant of this problem in order to decrease pressure on physicians. Civic and government organizations must work together in order to prevent further spread of antibiotic resistance.

References:

1. WHO Guidelines for Management of Acute Respiratory Infection, January 2000.
2. Feigin R., Textbook of Pediatric Infectious Disease, Third Ed., 1992.
3. Mainous III, A., Antibiotics and upper respiratory tract infection: Do some folks think there is a cure for common cold?, *Journal of Family Practice*, Volume 42, Nov. 4, April 1996.
4. Pichichero, M., Outcomes after judicious antibiotic use for respiratory tract infections seen in a private pediatric practice, *Journal of Pediatrics*, Volume 105, No. 4, April 2000.
5. Watson, R., Antimicrobial use for pediatric upper respiratory infection: Reported practice, actual practice and parent beliefs, *Journal of Pediatrics*, Volume 104, No. 6, December 1999.
6. Dowell, S., Principles of judicious use of antimicrobial agents for pediatric upper respiratory tract infections, *Pediatrics*, Volume 101, No. 1, January 1998. Suppl.
7. Palmer DA., Baucher, H., Pearson C., Zuckerman K. Parents beliefs about antibiotics., *Archive of Pediatric Adolescent Medicine*, 1996.
8. Bautista & Valdez, MD, Knowledge about common pediatric infections and antibiotic therapy in parents of children seen at a tertiary hospital ER for outpatient consultations, *Philippine Journal of Pediatrics*, Vol, 50, No. 1, January-March 2001.
9. Bauchner, H., Pelton, Stephen I., Klein Jerome O. Parents, physicians and antibiotic use., *Pediatrics* Vol. 103., No. 2, Feb 1999.
10. Schwartz, B., Marcy, M., Phillips, W., Gerber, M., Pharyngitis – principles of judicious use of antimicrobial agents., *Pediatrics*, Vol., 101, No. 1, January 1998., Suppl.
11. O'Brien, K., Dowell, S., Schwartz, B., Marcy, M., Cough illness/ bronchitis – Principles of judicious use of antimicrobial agents., *Pediatrics*, Vol. 101, No. 1, January 1998., Suppl.
12. Rosenstein, N., Phillips, W., Gerber, M., The common cold – Principles of judicious use of antimicrobial agents., *Pediatrics*, Vol 101., No. 1, January 1998., Suppl.
13. Schwartz, R. Freji, B., Ziai, M., Sheridan, M. Antimicrobial prescribing for acute purulent rhinitis in children: A survey of pediatricians and family practitioners, *Pediatric Infectious Disease Journal* 1997.
14. Gadomski AM. Potential inteventions for preventing pneumonia among young children: Lack of antibiotic treatment for upper respiratory infections. *Pediatric Infectious Disease Journal* 1993.