Physicians Knowledge of prescribing antibiotics for acute Upper Respiratory Tract Infection

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Abstract: Background: Upper respiratory tract infection (URTI) is a nonspecific term used to describe acute infections involving the nose, ear, Para nasal sinuses and the throat. Although 90 %-95 % of upper respiratory tract infections are viral in origin, antibiotics often used to treat viral URTI. However, frequent inappropriate antibiotic use contributes to the emergence of drug-resistance bacterial pathogens. It is not recommended to use antibiotics to treat URTI and when indicated to use narrow instead of broad-spectrum antibiotics. **The aim** of this study was to asses knowledge of physicians toward using antibiotics in treatment of upper respiratory tract infection. **Subject and methods:** A cross sectional study was conducted covering both emergency room and family medicine department. A stratified random sampling technique was used. **Results:** The study involved 70 physicians, 14(6.1 %) physicians from emergency room and 56 (92.9 %) physicians from family medicine department. Their mean ages were 38.55 % (SD± 9.21). Saudi nationality accounted for 28.6 % of physicians. Out of the total interviewed physicians, 60.3 % prescribed antibiotics for patients diagnosed to have upper respiratory tract infection. The most common indication to start antibiotics immediately was purulent discharge. Most physicians 57.1 % follow up their patients to asses the response antibiotics. Only 4.4 % of physicians never prescribed antibiotics for patients diagnosed to have URTI and their main reason was that URTI is viral in origin. However, 61.4 % would start antibiotics if patients had exudates in the throat. According to position 7(77.8%) of consultants, 8(61.5%) of specialists, 9(52.9%) residents and 10(34.5) GPs having high score. **Conclusion:** Unnecessary antibiotic for the treatment of URTI is still prescribing. It is a common unsuitable physician practice. Physicians who have high qualifications should play a major role in decreasing this problem.

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Key Words: Upper respiratory tract infection, knowledge, physicians and antibiotic.

1.Introduction:

Upper respiratory tract infections (URTIs) are the most common infections among human that affect children as well as adult age group. It includes the clinical syndromes of common cold, acute bronchitis, pneumonia, pharyngitis, sinusitis, and otitis media. Adults develop an average of two to four colds per year. Most of URTIs are caused by viruses. The majority of these are picorna viruses of the rhinovirus group. However, adenoviruses, coronviruses, Coxsackie's viruses, echoviruses, influenza viruses, Para influenza viruses and the respiratory syncytial viruses can all cause upper respiratory tract infections. URTI occurs commonly in late winter months and spring. In most patients, the illness is self-limiting and subsides after a few days. Antibiotics are generally not required for treatment. (1)

Antibiotics are widely prescribed for URTIs of viral etiology, and the current widespread use of antibiotics has significant costs, in addition to the substantial monetary costs, over use of antibiotics for URTIs has contributed to the emergence and spread of resistance bacteria. (2)

Almost 90% -95% of upper respiratory tract infections are viral in origin, the current management relies on an over use of drugs, especially antibiotics.(3) Antibiotics treatment in URTI does not enhance illness resolution. They are not recommended in conditions that are unlikely to respond to these agents and when indicated should be restricted to narrow instead of broad-spectrum preparations. (4)

URTIs are a major health problem in many countries. It is a common illness with high incidence and morbidity in both developed and developing countries. World wide, it is responsible for approximately 50 % of morbidity among children with relatively high incidence in adult resulting in disability with subsequent economic loss. In the United States, it accounts for 75 % for physicians' office visits. (5) A national survey conducted in 1996 in the United States, estimated 2.7 million visits for upper respiratory tract infections. (6)

In 1992, a national medical care survey was conducted in the United States, estimated the prevalence of antibiotics prescription for URTI to be more than 50%, [7] in 1997, it was reduced to 42.1 %. In a Canadian population it was reduced by almost one third. These declines in antibiotic prescription were consequences of community- wide campaigns, training of physicians, continuous education and access to relevant information. [(8)]

Data from Iceland suggest that community-wide consumption of antimicrobial agents is positively associated with nasopharyngeal carriage of penicillin- resistance pneumococci [9]. While data from Finland indicate that after a nationwide reduction in use of macrolides antibiotics for outpatient therapy, there was a significant decline in the prevalence of erythromycin- resistance group a streptococci. [(10)]

Antibiotics are commonly prescribed for patients with upper respiratory tract infections, even though they are ineffective. The main reasons for physicians to prescribe antibiotics for URTI were diagnostic uncertainty, febrile and ill looking patients and patients demanding antibiotics [(11).]

Improving prescribing practices through educational intervention was an important measure; in one study done during 1996 in Mexico City found that, 40 % of physicians improved their prescribing practices after they received interactive educational strategies. [(12)]

In the Kingdom of Saudi Arabia, URTI were found to be responsible for 50% of morbidity as reported in health care centers in 1995, and up to 60% as reported in 1996.[(13)]

A community based survey conducted in the northern region of Saudi Arabia (Arar and Turaif) during 1998, to determine the magnitude of factors associated with respiratory tract infection and their treatment, a random sample of 1200 prescription was analysed, and found that of the prescription analysed, URTI accounted for more than two thirds. Pharyngitis, tonsillitis and acute bronchitis and common cold were the most frequently diagnosed (41.3 % and 31.9 % and 21.9 % respectively). Pneumonia accounted for less than 1% of diagnosis. There were more urban than rural residents diagnosed with URTI. This may be due to urban resident having better access to primary health care centers, or being more willing to seek medical attention. There were significantly higher portion of URTI among males Antibiotics were the most frequently prescribed medications for patients with URTIs, 87.8% received one or more antibiotics. [(14)]

2.Methods:

Aim of the study:

1- To assess the knowledge of physicians working in Emergency/Family Medicine departments regarding antibiotic prescriptions in treatment of acute upper respiratory tract infection

2- To determine the effect of demographic characteristics and background of physicians on their knowledge regarding antibiotic prescriptions.

2. Subject and methods:

A cross sectional study was conducted to evaluate the Physicians Knowledge of prescribing antibiotics for acute Upper Respiratory Tract Infection. All the physicians (General Practitioner,residents,registrars or consultants) who are working in the family medicine clinics and emergency room in NWAFH in Tabuk.

For data collection, a self- administered questionnaire was designed to collect specific information from physicians. The variants included physician's demographic information such as age, nationality, and educational level, place of work and duration of experience. The questionnaire also assesses physician's knowledge about acute upper respiratory tract infection, common type of antibiotics frequently used, indication of uses and the common side effect resulting from overuse of antibiotics, various factors affecting their decisions.

To measure the knowledge of physicians about using antibiotics in URTI we did an answer key (which in each question) we knew the right and wrong answer. Then we calculated the right answer for each question.The highest possible score was 35 given to the physician who answered all the questions correctly while the lowest possible score was 0 if all answers were wrong.

We distributed the physician score in two Groups; High score (>23.5), Low score (<23.5).

To compare different possible factors affecting the score like: Age, gender, Nationality, Position, year of Graduation and place of work we classify the scores reached by each physician to high or low score (according to median 23.5).

Data analysis:

Data entry and analysis will be done using Epi info.Measuring the frequencies of the studied variables, the effect of different explanatory variables on different outcome variables were estimated.

3. Results:

The mean of physicians age was 38.55 years with standard deviation 9.21 The year of Graduating from medical college ranged from 1969 – 2004 were the mode was 2002.

Table (1) shows Socio demographic features of physician :

Regarding the level of physician, 29(41.4%) were general practitioner, 19 (27.1%) resident, 13 (18.6%) specialist, 9 (12.9%) consultant.

Regarding the gender of physician 55 (78.6%) were male and 15 (21.4%) were female.

There were 20 (28.6%) Saudi and 50 (71.4%) non-Saudi physicians. 14(20.0%) were physicians work in emergency medicine department and 56 (80.0%) were physicians working in family medicine department.

Table (2) reveals Frequency of Prescribing antibiotic for U.R.T.I and physicians ordering diagnostic lab investigation before treating U.R.T.I patient.

No physician think that U.R.T.I is a necessary indication for prescribing antibiotics to all patients with U.R.T.I (0%) but usually 6 (8.8%), sometimes 41(60.3%), rarely 18 (26.5%), never 3 (4.4%). Out of 68 physicians who answered the question about frequency of ordering diagnostic lab investigation before treatment, the result was that: 6 (8.8%) physicians always ordering lab investigation, sometimes 23(33.8%), rarely 23 (33.8%), not sure 1 (1.5%), never 15 (22.1%).

Table (1): Socio demographic features of physicians:

variables	Frequency	Percent
Level of physician:		
General practitioner	29	41.4%
Resident	19	27.1%
Specialist	13	18.6%
Consultant	9	12.9%
Total	70	100%
Gender		
Male	55	78.6%
Female	15	21.4%
Total	70	100%
Nationality of physicians:		
Saudi	20	28.6%
Non Saudi	50	71.4%
Total	70	100%
Place of work		
Emergency	14	20.0%
Family medicine	56	80.0%
Total	70	100%

Table (2): Frequency of prescribing antibiotic for U.R.T.I and physicians ordering diagnostic lab investigation before treating U.R.T.I patient.

variables	Frequency	Percent
Prescribing antibiotic for U.R.T.I		
Always	0	0%
Usually	6	8.8%
Some times	41	60.3%
Rarely	18	26.5%
Never	3	4.4%
Total	68	100%
Frequency of physicians ordering diagnostic lab investigation		
Always	6	8.8%
Sometimes	23	33.8%
Rarely	23	33.8%
Not sure	1	1.5%
Never	15	22.1%
Total	68	100%

Table (3) shows Physician knowledge:

About the indications of using antibiotics for U.R.T.I, all 70(100%) physicians knew that common cold is not an indication,18(25.7%) physicians thought that acute pharyngitis is an indication,46(65.7%) physicians thought that acute sinusitis is an indication,48(68.6%) physicians thought that acute otitis media is an indication,45(64.3%) physicians thought that acute epiglottis is an indication,64(91.4%) physicians thought that pneumonia is an indication.

The factors affecting decision of physician to prescribe antibiotic were 34 (48.6%) Patient looking very ill, 51 (72.9%) purulent discharge, high fever >38.5c 21 (30%),43 (61.4%) exudates in the throat,32 (45.7%) inflamed eardrum, 27 (38.6%) cervical lymphadenopathy, 39 (55.7%) crepitating at lung

auscultation,7 (10%) presence of cough, 35 (50%) persistent fever over three days.

Out of 70 physicians who answered the reason for prescribing antibiotics for U.R.T.I 7 (10%) to relieve symptoms of illness, 28 (40%) to prevent secondary bacterial infections, 15 (21.4%) to shorten the duration of illness, 18 (25.7%) to demand / pressure from the patient or his relatives, 4 (5.7%) personal belief in importance, 11(15.7%) others prescribing reason.

Trying to discover the factors or thoughts that prevent the physicians from prescribing antibiotics to U.R.T.I patient, we found that 65 (92.9%) physicians thought that the most U.R.T.I are of viral etiology,47 (67.1%) U.R.T.I are self – limiting, 7 (10%) inconvenient for patients, 8 (11.4%) fear of side effects, 14 (20%) costly, 29 (41.4%) no benefit if it is used for treatment.

The answers about thoughts of physicians to follow patients after prescribing antibiotics were that: 17 (24.3%) no need to follow – up, 6 (8.6%) just as routine follow – up for patient, 40 (57.1%) to assess their response to antibiotic, 20 (28.6%) to identify any side effect, 2 (2.9%) other follow – up reason.

The physicians thought the side effects of prescribing unnecessary antibiotics for URTI patient were: 66 (94.3%) Bacterial Resistance, 22 (31.4%) decrease immunity, 47 (67.1%) increase growth of fungi and commensals, 43 (61.4%) allergy, 46 (65.7%) diarrhea and vomiting, 55 (78.6%) unnecessary cost, 34 (48.6%) serious renal and hepatic complication, 1 (1.4%) other unnecessary antibiotic reason). **Table (4) shows scoring of the relation between socio demographic features and knowledge:**

Range was 13 to 29, Mode 21 and median 23.5.Increasing score directly increased with increasing age.

Male physicians with low score were 31 (56.4%) while 26 (43.6%) male physicians have high score. Female physicians with low score were 6 (40%) while 9 (60%) female physicians high score. 11(57.9%) Saudi physicians had low score while 8 (42.1%) physicians had high score while 24 (47.1%) non Saudi physicians had low score while 27 (52.9%) non Saudi physicians had high score.

The recently Graduated physicians have low score compared to old Graduated physicians who have high score. 19 (65.5%) of General Practitioners had low score while 10 (34.5%) General practitioners had high score, 9 (47.4%) Residents had low score while 10 (52.6%) Residents had high score, 5 (38.5%) Specialist had low score while 8 (61.5%) Specialist had high score, 2 (22.2%) Consultants had low score while 7 (77.8%) Consultants had high score.

Out of 70 physicians 33 (47.1%) had low score, 4 (28.6 %) physicians work in emergency and 29 (51.8%) physicians work in family medicine department. 37 (51.9 %) physicians had high score, 10 (71.4%) physicians work in emergency and 27 (48.6%) physicians work in family medicine department.

Table (3): Physician knowledge indication for prescribing antibiotics for U.R.T.I:

	Yes	No
The condition that antibiotic should be prescribed		
Common cold	0 (0%)	70 (100%)
Acute pharyngitis	18 (25.7%)	52 (74.3%)
Acute sinusitis	46 (65.7%)	24 (34.3%)
Acute otitis media	48 (68.6%)	22 (31.4%)
Acute epiglottis	45 (64.3%)	25 (35.7%)
Pneumonia	64 (91.4%)	6 (8.6%)
Factor that affect decision to prescribing antibiotic:		
Patient looking very ill	34 (48.6%)	36 (51.4%)
Purulent discharge	51 (72.9%)	19 (27.1%)
High fever >38.5	21 (30%)	49 (70%)
Exudates in the throat	43 (61.4%)	27 (38.6%)
Inflamed eardrum	32 (45.7%)	38 (54.3%)
Cervical lymphadenopathy	27 (38.6%)	43 (61.4%)
Crepitations at lung auscultation	39 (55.7%)	31 (44.3%)
Presence of cough	7 (10%)	63 (90%)
Variables	**Yes**	No
Persistent fever over three days	35 (50%)	35 (50%)
The reasons that physicians are prescribing antibiotic		
Relieve symptoms of illness	7 (10%)	63 (90%)
Prevent secondary bacterial infections	28 (40%)	42 (60%)
Shorten the duration of illness	15 (21.4%)	55 (78.6%)
Demand / pressure from the patient or his relatives	18 (25.7%)	52 (74.3%)
Personal belief in importance	4 (5.7%)	66 (94.3%)
Other	11 (15.7 %)	59 (84.3%)
The reason prevent physicians from prescribing antibiotics		
Most URTIs are of viral etiology	65 (92.9%)	5 (7.1%)
URTIs are self-limiting	47 (67.1%)	23 (32.9%)
Inconvenient for patients	7 (10%)	63 (90%)
Fear of side effects	8 (11.4%)	62 (88.6%)
Costly	14 (20%)	56 (80%)
No benefit if it is used for treatment	29 (41.4%)	41(58.6%)
Other not prescribing reason	0 (100%)	70 (100%)
Possible reasons for physicians to follow patients after prescribing antibiotics		
No need to follow–up	17 (24.3%)	53 (75.7%)
Just as a routine follow up for patients	6 (8.6%)	64 (91.4%)
To asses their response to antibiotic	40 (57.1%)	30 (42.9%)
To be sure of the diagnosis	15 (21.4%)	55 (78.6%)
To identify any side effects	20 (28.6%)	50 (71.4%)
Other reason follow–up	2 (2.9%)	68 (97.1%)
Side effects of prescribing unnecessary antibiotic		
Bacterial Resistance	66 (94.3%)	4 (5.7%)
Decrease immunity	22 (31.4%)	48 (68.6%)
Increase growth of fungi and commensales	47 (67.1%)	23 (32.9%)
Allergy	43 (61.4%)	27 (38.6%)
Diarrhea and vomiting	46 (65.7%)	24 (38.3%)
Unnecessary cost	55 (78.6%)	15 (21.4%)
Serious renal and hepatic complications	34 (48.6%)	36 (51.4%)
Others	1 (1.4%)	69 (98.6%)

Table (4) shows scoring of the relation between socio demographic features and knowledge:

Variables	Low score	High score
Gender		
Male	31 (56.4%)	**24 (43.6%)**
Female	6 (40%)	**9 (60%)**
Total	37 (52.9%)	33 (47.1%)
Nationality		
Saudi	11 (57.9%)	8 (42.1%)
Non Saudi	24 (47.1%)	27 (52.9%)
Total	35 (50%)	35 (50%)
Position		
General practice	19 (65.5%)	10 (34.5%)
Resident	9(47.4%)	10 (52.6%)
Specialist	5 (38.5%)	8 (61.5%)
Consultant	2(22.2%)	7 (77.8%)
Total	35 (50%)	35 (50%)
Place of work		
Emergency	4 (28.6%)	10 (71.4%)
Family medicine department	29 (51.8%)	27 (48.2%)
Total	33 (48.5%)	37(51.5%)

4. Discussion:

Antibiotics over use in practice is a major health problem worldwide, and it is one of the contributing factors to antibiotics- resistance bacteria in community, antibiotics used frequently in management of upper respiratory tract infection, although majority of these infections are viral in origin.[16]

Sociodemographic features:

As were expected that most physicians were G.Ps or residents who are middle aged physicians.

The reason of answering the questionnaire by family medicine physicians was higher than E.R physicians because the family medicine department had more number of clinics with fixed time of work which helps them to answer the questionnaire and make it easy to recollect again.

Majority of physicians prescribed antibiotics for pneumonia followed by acute otitis media and acute sinusitis. Antibiotics should be preserved for patients with pneumonia, otitis media, or sinusitis [18]. In some countries, acute otitis media is not treated with antibiotics, and systemic reviews have shown little benefit with antibiotic treatment. [6]

Most powerful factor pressing on physicians to prescribe antibiotics is purulent discharge and the least factor is the presence of cough. Respiratory tract infections are difficult to prevent due to multiplicity of agents, periodic antigenic changes, especially among viruses, and lack of specific treatment. Early case- finding and proper management are therefore very important. Laboratory tools are not particularly useful in the diagnosis, so antibiotics should be used only when clinically indicated. [18]

All physicians knew that it is not necessary to give antibiotics for U.R.T.I but some physicians think that they should not prescribe antibiotics for U.R.T.I patient in any way.

Most physicians were supporting to avoid unnecessary prescribing antibiotic in U.R.T.I. Most U.R.T.Is are viral or they are a self – limiting diseases.

Most physicians prescribed antibiotics to prevent 2ndry bacterial infection. However, antibiotics administrated did not reduce the incidence of these infections. [6]

In several surveys, most physicians agreed that there is over prescription of antibiotics, which could lead to bacterial resistance [16]. Most of the physician thought that prescribing unnecessary antibiotic will lead to Bacterial Resistance or unnecessary cost. The immediate hazards of antibiotic use are increased side effect and costs of therapy [17]. Recent antibiotic uses increase the likelihood that resistance strains will develop.[9]

The relation between socio demographic features and knowledge:

Increasing score directly increase with increasing age. As expected with increasing level of education physicians are more familiar to deal or read about using antibiotic in U.R.T.I

The highest score were got by the consultant which was expected because they are more expert to deal with these problems but the GPs had the lowest score.

The recent Graduate have low score comparing old Graduated high score. The consultants and old physicians were more expected to have higher scores.

The emergency department physicians scored higher than the family medicine physicians and these abnormal situation can be explained by the following reasons: Physicians from other departments assigned to the Emergency department during their residency training (e.g medicine, paediatrics, general surgery) while being seniors.

Conclusion:

Unnecessary antibiotic for the treatment of URTI is still prescribing. It is a common unsuitable physician practice. Physicians who have high qualifications should play a major role in decreasing this problem.

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