

## Common antibiotics prescribed for acute respiratory tract infected children in Libya.

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### **Abstract:**

**Background:** Acute respiratory infection is a common disease in children. Most cases were due to upper respiratory tract infection. Early intervention and prompt treatment of acute respiratory infections are the easiest ways to prevent complications. **Objective of the study:** to determine the indications, frequency, and types of antibiotics used in hospitalized paediatric patients Messellata General Hospital, Messellata, Libya and to evaluate whether the prescribed antibiotics were based on the isolation of organism and their sensitivity. **Study Design:** Descriptive observational hospital based study. **Results and discussion:** A total of 200 child patients were included over 6 months of study period, in whom antibiotics were prescribed at the time of admission. The majority were between < 2 and 8 years of age. Fever was the commonest symptom. Out of 200 encounters for patients with various acute respiratory infections, acute pharyngotonsillitis were (62.5%), followed by acute laryngitis (26.5%). Acute pneumonia represented by (11%) of the total acute respiratory infection cases. Penicillins were the most commonly prescribed antibiotics for acute pharyngotonsillitis among children patients (40.8% of prescriptions), followed by cephalosporins (36.0%) and aminoglycosides (23.2%). A high percentage (59.1%) of children patients diagnosed with acute pneumonia was treated with cephalosporins, whereas (27.3%) of children patients with acute pneumonia were treated with penicillins. However, only (13.6%) of children patients with acute pneumonia often treated with aminoglycosides antibiotics. In case of acute laryngitis, the antibiotic prescription rates were as follow: Penicillins (58.5%), Cephalosporins (30.2%) and aminoglycosides (11.3%).

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### **I. Introduction:**

Acute respiratory infection is defined as an infectious disease in the upper and lower respiratory tract. The upper respiratory tract consists of the airways from the nostrils to the vocal cords in the larynx, including the paranasal sinuses and the middle ear. Upper respiratory tract infections include colds, laryngitis, pharyngitis/tonsillitis, rhinitis, acute rhinosinusitis and acute otitis media. The lower respiratory tract covers the continuation of the airways from the trachea and bronchi to the bronchioles and the alveoli. Lower respiratory tract infections include acute bronchitis, bronchiolitis, pneumonia and severe pneumonia <sup>[1]</sup>. Populations at high risk of acute respiratory tract infections are children under five years, the elderly, and patients with decreased immune systems. The incidence of upper respiratory tract infections are very high but rarely life threatening, whereas lower respiratory infections are responsible for more severe illnesses such as pneumonia, tuberculosis, and bronchiolitis which are major contributors to mortality of acute respiratory tract infection <sup>[2]</sup>. Acute respiratory infections and diarrheal diseases represent about half of the deaths in under-five children in Egypt and are responsible for 39% and 20% of outpatient consultations at primary health care facilities, respectively; they are also a common reason for hospital admissions <sup>[3]</sup>. Untreated acute respiratory infections often lead to pneumonia, which is more serious and causes 15 % of under-five deaths in Egypt. Early intervention and prompt treatment of acute respiratory infections and pneumonia are the easiest ways to prevent death <sup>[4]</sup>. Acute respiratory infections are considered the leading cause of acute illnesses worldwide and remain the most important cause of infant and young children mortality, accounting for about two million deaths (20% of all child deaths) each year <sup>[5]</sup>, and ranking first among causes of disability-adjusted life-years lost in developing countries (94.6 millions, 6.3% of total) <sup>[6]</sup>. The populations who are at higher risk for developing a fatal respiratory disease are the very young, the elderly, and the immune-compromised. While upper respiratory infections are very frequent but seldom life-threatening, lower respiratory infections are responsible for more severe illnesses such as influenza, pneumonia, tuberculosis, and bronchiolitis that are the leading contributors to acute respiratory infections mortality <sup>[7]</sup>. WHO also reported that in developing countries such as Nigeria, Gambia, Senegal, Chad, Cameroon, Burkina Faso, and Mali the incidence of acute respiratory tract infection was about 15-21 % of children aged less than five years <sup>[8]</sup>.

## II. Subjects and method:

This study was carried out on **200** children patients at Pediatric Department of Messellata General Hospital, Messellata, Libya. The study was carried out on pediatric patients with acute respiratory tract infections. Demographic and clinical data were collected retrospectively from patient medical records who had been admitted to pediatric clinic during January to June 2014. **Inclusion criteria:** Hospitalized patients under Eight years of age suffering from acute respiratory infections. **Exclusion criteria:** Other infectious diseases, abnormal liver or kidney function, chronic diseases and patients with incomplete medical records. Statistical analysis of the results was carried out using SPSS package (version 20.0).

## III. Results & discussion:

The studied group included 98 males (49.0%) and 102 females (51.0%) children, their age ranged from 5 months to 8 years. Most of the patients were within age range 3-5 years old (males 25% and females 22.5%), followed by age range less than two years old (males 15% and females 17.5%). The lowest number was observed within age range 6-8 years old (males 9% and females 11%). The increased risk of acute respiratory infections among young aged children may be due to poorly developed immune system and maternally acquired (passive) immunity was waning. Also the immaturity of CNS respiratory derive system, anatomic features of upper air way that predispose to collapse or obstruction, a compliant thoracic cage, poorly developed respiratory muscles and limited available energy stores may be risk factors<sup>[9]</sup>. From this study, we found that the total proportion of acute pharyngotonsillitis was (62.5%), followed by acute laryngitis (26.5%) and acute pneumonia represented by (11%) of the total acute respiratory infection cases (**table 2**). For children attending clinics of acute care hospitals, presentation with fever, cough, loss of appetite, sore throat, or a caregiver preference that an antibiotic be prescribed, were associated with an antibiotic prescription for acute respiratory infections.

**Table (1): Distribution of children patients according to their age and gender.**

Age/years	Male		Female		Total	
	Number	%	Number	%	Number	%
< 2	30.0	15.0	35	17.5	65	32.5
3-5	50.0	25.0	45	22.5	95	47.5
6-8	18.0	9.0	22	11.0	40	20.0
Total	98.0	49.0	102	51.0	200	100

N.B. % were correlated to the total number of children patients involved in the study.

**Table (2): The distribution of cases according to illness.**

Illness	Male		Female		Total	
	Number	%	Number	%	Number	%
Acute pharyngotonsillitis	60.0	30.0	65	32.5	125	62.5
Acute pneumonia	10.0	5.0	12	6.0	22	11.0
Acute laryngitis	28.0	14.0	25	12.5	53	26.5
Total	98.0	49.0	102	51	200	100

N.B. % were correlated to the total number of children patients involved in the study.

**Table (3): The distribution of cases according to illness & prescribed antibiotics.**

Antibiotics	Acute pharyngotonsillitis		Acute pneumonia		Acute laryngitis	
	No	%	No	%	No	%
Penicillins	51.0	40.8	6.0	27.3	31.0	58.5
Cephalosporins	45.0	36.0	13.0	59.1	16.0	30.2
Aminoglycosides	29.0	23.2	3.0	13.6	6.0	11.3
Total	125.0	100.0	22	100.0	53	100.0

N.B. % were correlated to the total number of children patients in each illness state.

The antibiotic prescription rates for the various diagnostic categories for children and adults are described in (table 3).

Penicillins were the most commonly prescribed antibiotics for acute pharyngotonsillitis among children patients (40.8% of prescriptions), followed by cephalosporins (36.0%) and aminoglycosides (23.2%). A high percentage (59.1%) of children patients diagnosed with acute pneumonia was treated with cephalosporins, whereas (27.3%) of children patients with acute pneumonia were treated with penicillins. However, only (13.6%) of children patients with acute pneumonia often treated with aminoglycosides antibiotics. In case of acute laryngitis, the antibiotic prescription rates were as follow: Penicillins (58.5%), Cephalosporin (30.2%) and aminoglycosides (11.3%).

Over-prescribing of antibiotics in health care settings has brought along the worldwide problem of resistant pathogens, that the pharmaceutical industry is struggling to overcome by producing newer antibiotics. The existent recommendation that antibiotics are only indicated in bacterial infection is frequently not complied with. Physicians diagnose acute respiratory infections upon clinical findings but often disregard the fact that acute respiratory infections could be of viral origin and antibiotic treatment is not indicated [10].

It has been previously documented that clinicians prescribe antibiotics not only to relieve symptoms, but also to prevent disease transmission, prevent secondary infections and to satisfy patients demand for antibiotics [11].

Also a published research in Pakistan concerning acute respiratory tract infection; the author mentioned that antibiotics are often not needed as viruses are the most common causes of respiratory tract infections. Even in those cases where antibiotics are needed, drug of choice is either penicillin or ampicillin. Use of Ceftriaxone for treatment of respiratory infection observed in his study was deemed inappropriate. Moreover, the same author mentioned that the use of antibiotics in 65% of children with acute respiratory infections was higher than that of observed in Memphis, Tennessee, where 43% of children with uncomplicated acute respiratory infections had received antibiotics [12 & 13].

In Kentucky Medicaid study, 60% patients with common cold had received antibiotics [14]. In a recent survey of European primary care pediatrician, 43.5% of respondents overestimated the risks associated with not prescribing antibiotics [15].

The use of Macrolides and Quinolones in acute respiratory tract infections was not observed in our study as compared to other studies [16].

#### IV. Conclusion:

Our study demonstrates the inappropriate use of antimicrobials in acute febrile illnesses such as acute respiratory infections irrespective of admission or discharge diagnosis. In addition, third generation cephalosporin was used in acute respiratory infections despite the availability of first line therapy. There is a trend of continuing antibiotics on discharge and their use was neither substantiated by discharge diagnosis nor did bacterial isolate on blood or other specimen cultures. There is a perceived patient or parental pressure for prescribing antibiotics in the absence of bacterial infection. Efforts are needed to educate physicians in rational use of antibiotics.

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