COMMON PEDIATRIC DISEASES IN OMAN BASED ON PRESCRIPTION AUDIT

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ABSTRACT
Infectious diseases are a major concern of all the health care providers, the rational use of antibiotics and immunizations programs are widely studied to improve the health of a child. This study was hypothesized that the upper respiratory tract diseases are the most common diseases among Omani children. The aim of the present study was to evaluate the prevalence of commonly diagnosed pediatric diseases and to estimate the needs and priorities of pharmacy services. Objectives: Objectives of the study are to estimate the relevance of attending pediatrics care centers in governmental hospitals in Oman, to identify the most spread pediatric disease among Omani children. Methodology: This study was carried out as survey method by collecting data from hospitals through prescriptions. Result: It also showed that 41% of cases of upper respiratory tract diseases found in the ENT clinic, 23% found in the General Practice clinic, 16% found in the Dermatological clinic, and 11% found in the Eye clinic.
INTRODUCTION

Children represent the future, and ensuring their healthy growth and development are the prime concern of all societies. Children and newborns are particularly vulnerable to malnutrition and infectious diseases. Nearly 10 million children under the age of five die each year, more than 1000 children die every hour. Actually most could survive with access to simple interventions. The risk of death is highest in the first month of life. Preterm birth, birth asphyxia and infections cause most newborn deaths. From one month to five years of age, the main causes of death are pneumonia, diarrhea, malaria, measles and HIV. Malnutrition is estimated to contribute to more than one third of all child deaths.

Pneumonia is the prime cause of death in children under five years of age. Nearly three-quarters of all cases occur in just 15 countries. Addressing the major risk factors – including malnutrition and indoor air pollution – is essential to preventing pneumonia, as are vaccination and breastfeeding. Antibiotics and oxygen are vital tools for effectively managing the illness. Diarrheal diseases are a leading cause of sickness and death among children in developing countries. Breastfeeding helps prevent diarrhea among young children. Treatment for sick children with Oral Rehydration Salts (ORS) combined with zinc supplements is safe, cost-effective, and saves lives. One African child dies every 30 seconds from malaria. Insecticide-treated nets prevent transmission and increase child survival. Over 90% of children with HIV are infected through mother-to-child transmission, which can be prevented with antiretroviral, as well as safer delivery and feeding practices. About 20 million children under five years old, worldwide are severely malnourished, which leaves them more vulnerable to illness and early death.¹

The following information are the major causes of death worldwide for children of below five years old in 2008

- Neonatal deaths 41%
- Pneumonia (post neonatal) 14%
- Diarrheal diseases (post neonatal) 14%
- Malaria 8%
- Non-communicable diseases (post neonatal) 4%
- Injuries (post neonatal) 3%
- HIV/AIDS 2%
- Measles 1%
- Other 13% ¹

Reductions in the mortality have been the result of public health programmes, including immunization, control of diarrheal diseases (CDD) and acute respiratory infections (ARI) and nutrition. Despite significant reduction in deaths from communicable diseases at later ages (age 1 – 5), most deaths occur in children less than one year of age.
In Arab countries, 17.3 million (24.9%) children are underweight, 23.9 million (34.3%) are stunted and 5.2 million (7.5%) are wasted. In addition, severe, acute protein energy malnutrition is a problem in countries with complex emergencies or those under economic and political sanctions. Among Arab Countries, successful implementation of the expanded programme of immunization (EPI) has remarkably contributed to the improvement of child survival by reducing mortality related to the communicable diseases like diphtheria, measles, tetanus and poliomyelitis.\(^1\) In Oman according to WHO, World Health Statistics, 2009, Under-five mortality rate (probability of dying by age 5 per 1000 live births) was 12, Infant mortality rate (per 1000 live births) was 10. Percentage distribution of causes of death in under-5 children in OMAN, 2004 were Neonatal 27.5, Diarrhea 20.0, Pneumonia 11.7, Injuries 4.4, HIV/AIDS 0.5, Malaria 0.1, Measles 0.0 and Other 35.\(^2\) The reported prevalence of congenital heart disease (20.19 per 10 000) in this study was lower than that reported among Delhi schoolchildren (3.2 per 1000) in India\(^3\) and in pupils in Denmark (6.1 per 1000). The prevalence of congenital heart disease at birth in Oman is 2 per 1000 live births\(^4\). The percentage of ventricular septal defects reported in the study is higher than that reported in the USA and England\(^5\).

Upper respiratory tract infection (URI) is a nonspecific term used to describe acute infections involving the nose, paranasal sinuses, pharynx, larynx, trachea, and bronchi. The prototype is the illness known as the common cold, which is discussed here, in addition to pharyngitis, sinusitis, and tracheobronchitis. Influenza is a systemic illness that involves the upper respiratory tract and should be differentiated from other URIs. Viruses cause most URIs, with rhinovirus, parainfluenza virus, coronavirus, adenovirus, respiratory syncytial virus, coxsackievirus, and influenza virus accounting for most cases.\(^6\) Human metapneumovirus is a newly discovered agent causing URIs. Group A beta-hemolytic streptococci (GABHS) cause 5% to 10% of cases of pharyngitis in adults.\(^7\) Other less common causes of bacterial pharyngitis include group C beta-hemolytic streptococci, \textit{Corynebacterium diphtheriae}, \textit{Neisseria gonorrhoeae}, \textit{Arcanobacterium haemolyticum}, \textit{Chlamydia pneumoniae}, \textit{Mycoplasma pneumoniae}, and herpes simplex virus. \textit{Streptococcus pneumoniae}, \textit{Haemophilus influenzae}, and \textit{Moraxella catarrhalis} are the most common organisms that cause the bacterial superinfection of viral acute sinusitis.\(^8\) Less than 10% of cases of acute tracheobronchitis are caused by \textit{Bordetella pertussis}, \textit{B. parapertussis}, \textit{M. pneumoniae}, or \textit{C. pneumoniae}.\(^9\) At times, children may become infected with fungi that only rarely infect people. In many instances, the children most susceptible to these infections have weakened immune systems because of cancer, chemotherapy, corticosteroids, organ transplantation, or an HIV infection. However, even children with normal disease-fighting systems can get these infections by breathing in the fungi. Fungi from the Fusarium species may cause Hyalohyphomycosis infection. These fungi can enter the body through the respiratory tract, sinuses, or skin. It may cause signs and symptoms associated with a sinus infection (sinusitis), a urinary tract infection, a blood infection, or meningitis. These infections may occur in children with weakened immune systems.
Children infected with HIV may be susceptible to a fungal disease called penicilliosis caused by Penicillium marneffei. This fungus is found in soil and decaying vegetation as well as in the air. It can cause signs and symptoms such as lung inflammation (pneumonitis) and acne-like skin lesions on the face, torso, arms, and legs. Phaeohyphomycosis is a large category of fungal infections that are caused by organisms from the Bipolaris, Curvularia, Exserohilum, Pseudallescheria, and Scedosporium species. These infections often involve the skin and, in some cases, the nasal passages and sinuses. They also can infect the brain, bones, and heart (endocarditis). Superficial infections can occur in children with healthy immune defenses, while more serious infections occur in children with weakened immune systems. Children with weakened immune systems are susceptible to trichosporonosis, which can infect the lung, heart, or bloodstream. The fungus Trichosporon beigeli, which can produce skin lesions on the torso, face, and arms, causes trichosporonosis. Other symptoms include a cough, fever, and bloody sputum. This organism is found in soil and can enter the body through the respiratory tract, gastrointestinal system, or skin wounds. When it infects humans, it is potentially life threatening. Treatment typically involves the use of amphotericin B or fluconazole. As with many other fungal infections, zygomycosis is most likely to occur in children with weakened immune systems. It may develop in children with leukemia, lymphoma, or diabetes and those who have used nonsterile bandages on wounds or cuts. Zygomycosis is caused by fungi from the Rhizopus, Mucor, Absidia, and Rhizomucor species and can cause nose and sinus infections. Affected children may have a fever, nasal congestion, and sinus discomfort. If the infection spreads, it can affect the lungs and brain, in the worst cases, cause pneumonia, infection of the brain, seizures, paralysis, and death. It is hypothesized that the upper respiratory tract diseases are the most common diseases among Omani children. Infectious diseases are a major concern of all the health care providers, the rational use of antibiotics and immunizations programs are widely studied to improve the health of a child.

The aim of the present study was to evaluate the prevalence of commonly diagnosed pediatric diseases and to estimate the needs and priorities of pharmacy services.

**OBJECTIVES**

- To estimate the relevance of attending pediatrics care centers in governmental hospitals in Oman.
- To identify the most spread pediatric disease among Omani children.

**METHODOLOGY**

This study was carried out as survey method by collecting data from hospitals through prescriptions.
Population of the study selected as per the following:
  Samples: Omani Children
  Age: From age of 1 month to 12 years
  Gender: Both males and females

Data collected:
  Totally 45-55 prescriptions were collected from governmental hospitals.
    • Army Force Hospital
    • Busher Poly Clinic
    • Barka Poly Clinic

Period of study:
  February -March / 2011

Categorization:
  1. Data were categorized depending on patients attending different clinics of
     General Practice
     EYE clinic
     DEMO clinic
     ENT
  2. Further categorization depend on number of prescriptions prescribed to
     different diseases
     Upper Respiratory Tract
     Infections
     Nausea /Vomiting/ Diarrhea
     Dermo-Fungal Infections
     Dermo-Bacterial Infections
     General Dermatological
     Conditions
     Ear Diseases
     Pediculosis/ Scabies
     Asthma
     Iron Deficiency
     Epilepsy
     Diabetes

Collected data from prescriptions were categorized and analyzed
RESULTS

Table 1: Number of prescriptions taken from each Clinic

<table>
<thead>
<tr>
<th>Health Services</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT clinic</td>
<td>58</td>
</tr>
<tr>
<td>General Practice</td>
<td>45</td>
</tr>
<tr>
<td>Derma clinic</td>
<td>23</td>
</tr>
<tr>
<td>Eye clinic</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>142</td>
</tr>
</tbody>
</table>

Figure 1: Percentage of Cases in Different Clinics
Table 2: Number of prescriptions with respect to different diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Prescriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Respiratory Tract Infections</td>
<td>72</td>
</tr>
<tr>
<td>Nausea / Vomiting / Diarrhea</td>
<td>13</td>
</tr>
<tr>
<td>Dermat-Fungal Infections</td>
<td>11</td>
</tr>
<tr>
<td>Dermat-Bacterial Infections</td>
<td>5</td>
</tr>
<tr>
<td>General Dermatological Conditions</td>
<td>4</td>
</tr>
<tr>
<td>Ear Diseases</td>
<td>3</td>
</tr>
<tr>
<td>Pediculosis / Scabies</td>
<td>3</td>
</tr>
<tr>
<td>Asthma</td>
<td>3</td>
</tr>
<tr>
<td>Iron Deficiency</td>
<td>3</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 2: Number of prescriptions with respect to different diseases
Eye Clinic:

<table>
<thead>
<tr>
<th>Infections</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergic Conjunctivitis</td>
<td>5</td>
</tr>
<tr>
<td>Eye Examination</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 3: Number of prescriptions with respect to different diseases in Eye Clinic
Derma Clinic

Table 4: Number of Prescriptions with respect to different diseases in derma clinic

<table>
<thead>
<tr>
<th>Disease</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fungal Infections</td>
<td>11</td>
</tr>
<tr>
<td>General Dermatological Condition</td>
<td>7</td>
</tr>
<tr>
<td>Pediculosis/ Scabies</td>
<td>3</td>
</tr>
<tr>
<td>Bacterial Infections</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 4: Number of prescriptions with respect to different diseases in the Derma Clinic

![Total number of cases in Dermo Clinic](chart.png)
Sore Throat / Common Cold
(Upper Respiratory Tract Infections)

Figure 5: Number of Prescriptions with respect to different diseases in the ENT Clinic

Table 6: Number of Prescriptions with respect to different diseases in GP

<table>
<thead>
<tr>
<th>Upper Respiratory Tract Infections</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea / Vomiting / Diarrhea</td>
<td>13</td>
</tr>
<tr>
<td>Asthma</td>
<td>3</td>
</tr>
<tr>
<td>Iron Deficiency</td>
<td>3</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
</tr>
</tbody>
</table>
DISCUSSION

As the hypothesis suggested that the upper respiratory tract diseases are the most spread diseases among Omani children, the results were also suggesting that the upper respiratory tract diseases are the most commonly spreading diseases among Omani children, with 51% of total number of diseases.

It also showed that 41% of cases of upper respiratory tract diseases found in the ENT clinic, 23% found in the General Practice clinic, 16% found in the Dermatological clinic, and 11% found in the Eye clinic. Total number of cases in the Eye clinic was 16 cases. It was found that the infectious diseases were predominant. Total number of cases in the dermatological clinic was 23 cases. It was found that the fungal infectious diseases cases were 11 out of 23 cases, which was highly predominant, than other general conditions which were found only 7.

Total number of cases in the ENT clinic was 58 cases. Out of 58 cases, 55 cases had infectious diseases which were found as very highly predominant, than other conditions, which I found only 3 cases. Total number of cases in the GP clinic was 45 cases. Here also it was found that the
infectious diseases were predominant compared to other major diseases. In General practice clinic, other major diseases were not reported frequently because most are reported in other specialty hospitals. Antibiotics are the most commonly prescribed drugs using many different routes of administrations. The results showed that for most of the upper respiratory tract infections, oral antibacterial drugs were prescribed and for dermatological infectious diseases, topical antifungal were prescribed.

Finally, the overall results showed that infection is founded as the most common diseases in all the clinics. The 50 % of the pediatric cases reported that they suffering from diseases, due to infections. The reasons may be the parents and children are not having enough awareness about the importance of hygienic conditions and preventive measures for the infectious diseases for the children.

**CONCLUSION**

In conclusion, this study was carried out in three Governmental hospitals by collecting information about the pediatric diseases and drug dosage regimen from prescriptions dispensed to Omani children of both sex. Totally 142 prescriptions were collected randomly and then analyzed. The aim was to evaluate the prevalence of commonly diagnosed pediatric diseases and to estimate the needs and priorities of pharmacy services. The results suggested that the upper respiratory tract diseases are the most commonly spread diseases among Omani children, with a percentage of 51% of total number of diseases. Public health providers play the major role in pediatrics' heath prevention and promotion. They should prevent epidemics and spread of disease, prevent injuries, promote & encourage healthy behaviors by promoting health programs to the parents, assure quality and accessibility of health services and response immediately in an emergency.

The role of pharmacist in disease prevention and management are

- Identification of patients at risk.
- Education of patient on disease prevention and disease management strategies.
- Refer to physician for follow-up.
- Monitoring of drug therapy by ensuring compliance and adherence

Pharmacists’ responsibilities in disease prevention and management are:

- Promoting optimal use of antimicrobial agents
- Reducing transmission by vaccination
- Educating health professionals, patients, and public about antimicrobial stewardship and prevention and control of infection.
Hence few recommendations are given to improve the health care of children. They are:

- All countries should have 100% preventive measures (like vaccines) to protect children from illness such as measles, polio, diphtheria, tetanus, pertussis and *Haemophilus influenzae* type B.
- Children need medicines tailored to their age, body weight and physiological condition. Flexible solid oral dosage forms of medicines are ideal for children. Physicians should follow the proper procedures and methods of calculating child dose very strictly.
- The various reports showed that the lack of appropriate feeding and care, the child is at highest risk of dying during the first 28 days of life. So combined effort should be given from parents and health care providers to improve the child’s chances of survival and to lay the foundations for a healthy life.
- Health risks to newborns are minimized by:
  1. Quality care during pregnancy
  2. Safe delivery by a skilled birth attendant
  3. Strong neonatal care: immediate attention to breathing and warmth, hygienic cord and skin care, and early initiation of exclusive breastfeeding.

REFERENCES

1. www.who.int/en
2. www.moh.gov.om