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Research Article

A Study on Evaluation of Pediatric Infections Cases and Analysis of Prescription Practice for Management of Pediatric Infections in a Tertiary Care Hospital

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Abstract

Transmission of microbes among children and between children and healthcare personnel is a frequent risk due to the very close contact that occurs during care of infants and young children. Traditionally, multi-bed rooms are crowded with children, parents, and healthcare personnel. Although there are insufficient data at this time to support a definitive recommendation for single-patient rooms in NICUs, there is increasing experience that suggests a benefit to reduce the risk of infection and to improve neurosensory development. The present study aimed to evaluate the pediatric infections and analysis of prescription practice for management of pediatric infections in a tertiary care hospital. The prospective observational study was carried out for a period of 6 months. The study was conducted in Pediatrics department in a tertiary care hospital. A Total of 195 patients were enrolled in the study. In our study 5 years to 12 years age patients were more 69 (35.38 %) as compared to other ages. IV route of drug administration patients were more 104 (53.33%) as compared to other route of administered drugs. Four times daily frequency of antibiotics prescribed patients were more 85 (43.58%) as compared to other antibiotics frequencies. Macrolide drugs prescribed patients were more 34(17.43%) as compared to other prescribed drugs. Health care Interventions aimed at improving knowledge and training to staff in the issue of over prescription of antibiotics and in following a uniform prescription pattern designed by clinical regulatory authorities is highly advisable.

Keywords: Miglitol, assay, drug content, Korsmeyer equations, Carr's index

Article Info

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Contents

1. Introduction

All children deserve high-quality medical care. The following information from the American Academy of Pediatrics (AAP) lists some of the most common childhood illnesses and their approved treatments.

Sore Throat

Sore throats are common in children and can be painful. However, a sore throat that is caused by a virus does not need antibiotics. In those cases, no specific medicine is required, and your child should get better in seven to ten days. In other cases, a sore throat could be caused by an infection called streptococcal (strep throat). **Babies and toddlers rarely get it strep throat,** but they are more likely to become infected by streptococcus bacteria if they are in child care or if an older sibling has the illness. Although strep spreads mainly through coughs and sneezes, your child can also get it by touching a toy that an infected child has played with.

Ear Pain

Ear pain is common in children and can have many causes including ear infection (otitis media), swimmer's ear (infection of the skin in the ear canal), pressure from a cold or sinus infection, teeth pain radiating up the jaw to the ear, and others[1-5]. **Amoxicillin is the preferred antibiotic for middle ear infections** except when there is an allergy to penicillin or chronic or recurrent infections. **Many true ear infections are caused by viruses and do not require antibiotics.** If your pediatrician suspects your child's ear infection may be from a virus, he or she will talk with you about the best ways to help relieve child's ear pain until the virus runs its course.

Bladder infections, also called urinary tract infections or UTIs, occur when bacteria build up in the urinary tract. A UTI can be found in children from infancy through the teen years and into adulthood. Symptoms of a UTI include pain or burning during urination, the need to urinate frequently or urgently, bedwetting or accidents by a child who knows to use the toilet, abdominal pain, or side or back pain.

Skin Infection

In most children with skin infections, a skin test (culture or swab) may be needed to determine the most-appropriate treatment**.**

Bronchitis

Chronic bronchitis is an infection of the larger, more central airways in the lungs and is more often seen in adults. Often the word "bronchitis" is used to describe a chest virus and does not require antibiotics.

Bronchiolitis

Bronchiolitis is most often caused by a virus, which does not require antibiotics:

Instead, most treatment recommendations are geared toward making your child comfortable with close monitoring for any difficulty in breathing, eating, or signs of dehydration. Medicines used for patients with asthma (such as albuterol or steroids) are not recommended for most infants and young children with bronchiolitis. Children who were born prematurely or have underlying health problems may need different treatment plans[6-11].

Pain

Codeine should never be used for children as it's been associated with severe respiratory problems and even death in children.

Common Cold

Colds are caused by viruses in the upper respiratory tract. Many young children especially those in child care can get 6 to 8 colds per year. Symptoms of a cold (including runny nose, congestion, and cough) may last for up to ten days.

Bacterial Sinusitis

Sinusitis is suspected when cold-like symptoms such as nasal discharge, daytime cough, or both last over ten days without improvement.

Antibiotics may be needed if this condition is accompanied by thick yellow nasal discharge and a fever for at least 3 or 4 days in a row.

Cough

Coughs are usually caused by viruses and do not often require antibiotics. Developing effective prevention strategies for healthcare-associated infections (HAIs) in pediatric patients is a unique science that requires consideration of various host factors, sources of infection, routes of transmission, behaviors associated with care of infants and children, pathogens and their virulence factors, treatments, preventive therapies, and behavioral theory. Although the term nosocomial still applies to infections that are acquired in acute care hospitals, a more general term, healthcare-associated infections (HAIs), is now used since much care of high-risk patients, including those with medical devices (e.g., central venous catheters, ventilators, peritoneal dialysis catheters), has shifted to ambulatory settings, rehabilitation or chronic care facilities, and to the home; thus, often the geographic location of acquisition of the infection cannot be determined[12-16].

A true nosocomial infection is defined as an infection that was not incubating or present at the time of hospital admission, and that develops 48 hours or more after hospital admission or within 10 days of hospital discharge. In neonates, a transplacental infection is not considered a nosocomial infection. An infection is nosocomial, however, if a mother is not infected at the time of admission but delivers an infected infant more than 48 hours after her admission. The principles of transmission of infectious agents in healthcare settings and prevention are reviewed in the Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007.

The pediatric host is highly susceptible to common respiratory and gastrointestinal tract viruses (e.g., respiratory syncytial virus (RSV), influenza virus, rotavirus) that may be transmitted in healthcare settings in addition to the usual healthcare-associated bacteria and fungi. HAIs

can result in the serious morbidity and mortality that occur in adult patients and in lifetime physical, neurologic, and developmental disabilities. Infection rates between 2% and 13% of admissions or discharges from pediatric units are typical. Intensive care units, oncology services, and gastroenterology services that care for patients with short gut who are dependent on total parenteral nutrition (TPN) have the highest rates of bacterial and fungal infection associated with central venous catheters. Those children who have complex underlying diseases are at greatest risk for prolonged hospitalization, complications, and mortality associated with acquisition of new infections in the hospital. Severely immunosuppressed patients (e.g., allogeneic hematopoietic stem cell transplant (HSCT) recipients, children with leukemia undergoing intensive chemotherapy, solid-organ transplant recipients during the periods of most intense immunosuppression), are at increased risk for invasive aspergillosis and other environmental fungal infections, especially during periods of facility renovation, construction, and water leaks.

2. Methodology

The prospective observational study was carried out for a period of 6 months. The study was conducted in Pediatrics department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 195 patients were enrolled in the study.

Study Design: It was Prospective observational study.

Study Period: The Present study was conducted for a period of six months.

Study site: The Present study was conducted in department of Pediatrics department in a tertiary care hospital.

Sample size: It was 195 Patients.

Inclusion criteria

- Patients with infections.
- Patients of either sex, diagnosed with paediatric infections.
- Patients who are willing to give consent.
- Patients receiving treatment for paediatric infections.

Exclusion criteria

- Patients who were not willing to join in the study.

3. Results and discussion

Table 1: Age

In our study 1 month—6 months age patients were 22 (11.28%),7 months—12 months age patients were 45 (23.07%),1 year-2 years age patients were 28 (14.35%),3 years—4 years age patients were 31 (15.89%), 5 years—12 years age patients were 69 (35.38 %).

S.No	Age	Total N=195	Percentage (%)
1.	1 month—6 months	22	11.28
2.	7 months—12 months	45	23.07
3.	1 year-2 years	28	14.35
4.	3 years—4 years	31	15.89
5.	5 years—12 years	69	35.38
	Total	**195**	

Table 2: Laboratory tests

Blood test patients were 22 (11.28%), Urine culture test patients were 32 (16.41%), Liver function test patients were 41(21.02%), Renal function test patients were 52 (26.66%), Stool culture test patients were 48(24.61 %).

S.No	Laboratory tests	Total N=195	Percentage (%)
1.	Blood test	22	11.28
2.	Urine culture test	32	16.41
3.	Liver function test	41	21.02
4.	Renal function test	52	26.66
5.	Stool culture test	48	24.61
	Total	**195**	

Table 3: Routes of drug administration

IV route of drug administration patients were 104 (53.33%), Oral route of drug administration patients were 31(15.89%), Inhalational route of drug administration patients were 19(9.74%), IM route of drug administration patients were 41(21.02%).

S.No	Routes of drug administration	Total N=195	Percentage (%)
1.	IV	104	53.33
2.	Oral	31	15.89
3.	Inhalational	19	9.74
4.	IM	41	21.02
	Total	**195**	

Table 4: Clinical symptoms

Shortness of breath patients was 20 (10.25%),Wheezing patients was 31 (15.89%), Fever patients was 26 (13.33%),Vomiting patients was 29 (14.87%),Abdominal pain patients was 33 (16.92%), Cough patients was 56 (28.71 %).

S.No	Clinical symptoms	Total N=195	Percentage (%)
1.	Shortness of breath	20	10.25
2.	Wheezing	31	15.89

3.	Fever	26	13.33
4.	Vomiting	29	14.87
5.	Abdominal pain	33	16.92
6.	Cough	56	28.71
	Total	**195**	

Table 5: Distribution of disease illness in pediatrics

Respiratory system disease illness patients was 21(10.76%), Dermatology disease illness patients was 24(12.30%), Gastrointestinal infection disease illness patients was 28(14.35%), Urinary tract infection disease illness patients was 33(16.92%), Blood infection disease illness patients was 25(12.82%),Skin infection disease illness patients was 19(9.74%), Bone infection disease illness patients was 37(18.97%),CNS infections disease illness patients was 8(4.10 %).

S.No	Disease Illness	Total N=195	Percentage (%)
1.	Respiratory system	21	10.76
2.	Dermatology	24	12.30
3.	Gastrointestinal infection	28	14.35
4.	Urinary tract infection	33	16.92
5.	Blood infection	25	12.82
6.	Skin infection	19	9.74
7.	Bone infection	37	18.97
8.	CNS infections	8	4.10
	Total	**195**	

Table 6: Total number of antibiotics prescribed per patient

1-2 antibiotics prescribed patients were 52(26.66 %),3-4 antibiotics prescribed patients were 42(21.53%),5-6 antibiotics prescribed patients were 25(12.82%), 7-8 antibiotics prescribed patients were 76(38.97%).

S.No	Number of antibiotics	Total N=195	Percentage (%)
1.	1-2	52	26.66
2.	3-4	42	21.53
3.	5-6	25	12.82
4.	7-8	76	38.97
	Total	**195**	

Table 7: Duration of diseases

The Duration of diseases include 1-7 days duration disease patients were 33(16.92%), 8-10 days duration disease patients were 49(25.12%), 11-15 days duration disease patients were 26(13.33%), 16-20 days duration disease patients were 87 (44.61%).

S.No	Duration	Total N=195	Percentage (%)
1	1-7 days	33	16.92
2	8-10 days	49	25.12
3	11-15 days	26	13.33
4	16-20 days	87	44.61
	Total	**195**	

Table 8: Length of hospital stay

The length of hospital stay includes 1-7 days hospital admitted patients were 70(35.89%),8-10 days hospital admitted patients were 20(10.25%),11-12 days hospital admitted patients were 26(13.33%),13-15 days hospital admitted patients were 79(40.51%).

S.No	Length of hospital stay	Total N=195	Percentage (%)
1	1-7 days	70	35.89
2	8-10 days	20	10.25
3	11-12 days	26	13.33
4	13-15 days	79	40.51
	Total	**195**	

Table 9: Frequency of antibiotics prescribing

The frequency of antibiotics prescribing includes Once daily frequency of antibiotics prescribed patients were 37(18.97%), Twice daily frequency of antibiotics prescribed patients were 29(14.87%), Thrice daily frequency of antibiotics prescribed patients were 44(22.56%), Four times daily frequency of antibiotics prescribed patients were 85 (43.58%).

S.No	Frequency of antibiotics	Total N=195	Percentage (%)
1	Once daily	37	18.97
2	Twice daily	29	14.87
3	Thrice daily	44	22.56
4	Four times daily	85	43.58
	Total	**195**	

Table 10: Prescribing pattern drugs

The Prescribing pattern drugs includes The Prescribing pattern drugs includes Penicillin prescribed patients were 30(15.38%), Aminoglycosides drugs prescribed patients were 26(13.33%), Macrolide drugs prescribed patients were 34(17.43%), Fluroquinolone drugs prescribed patients were 20(10.25%), Anti Protozoal drugs prescribed patients were 17(8.71%), Anti-Fungal drugs prescribed patients were 24(12.30%), Anti-Viral drugs prescribed patients were 10(5.12%),Cephalosporin drugs prescribed patients were 28(14.35%),Multivitamins drugs prescribed patients were 6(3.07 %).

S.No	Prescribing pattern of drugs	Total N=195	Percentage (%)
1	Penicillin	30	15.38
2	Aminoglycosides	26	13.33
3	Macrolide	34	17.43
4	Fluroquinolone	20	10.25
5	Anti Protozoal	17	8.71
6	Anti Fungal	24	12.30
7	Anti Viral	10	5.12
8	Cephalosporin	28	14.35
9	Multivitamins	6	3.07
	Total	**195**	

Discussion

- In our study 5 years to 12 years age patients were more 69 (35.38 %) as compared to other ages.
- Renal function test done patients were more 52 (26.66%) as compared to other laboratory examinations.
- IV route of drug administration patients were more 104 (53.33%) as compared to other route of administered drugs.
- Cough clinical symptom patients were more 56 (28.71 %) as compared to other clinical symptoms.
- Bone infection disease illness patients were more 37(18.97%) as compared to other diseases.
- 7-8 antibiotics prescribed patients were more 76(38.97%) as compared to other prescribed drugs.
- 16-20 days duration disease patients were more 87 (44.61%) as compared to other disease durations[17-18].
- 13-15 days hospital admitted patients were more 79(40.51%) as compared to other hospital stay durations.
- Four times daily frequency of antibiotics prescribed patients were more 85 (43.58%) as compared to other antibiotics frequencies.
- Macrolide drugs prescribed patients were more 34(17.43%) as compared to other prescribed drugs.

4. Conclusion

This study gives an overview of prescribing pattern of drugs in children in our tertiary care teaching hospital. Fever was the most common indication for prescribed antibiotics, followed by surgical-related cases. In our study 5 years to 12 years age patients were more 69 (35.38 %) as compared to other ages. IV route of drug administration patients were more 104 (53.33%) as compared to other route of administered drugs. Four times daily frequency of antibiotics prescribed patients were more 85 (43.58%) as compared to other antibiotics frequencies. Macrolide drugs prescribed patients were more 34(17.43%) as compared to other prescribed drugs. Irrational FDCs are being commonly prescribed and there is an urgent need to curb these harmful practices by stringent regulations and developing local guidelines for rational prescribing[19-24]. Although usage of antibiotics and parenteral drugs were conforming to WHO recommended standards, there is a need to improve prescription pattern by generic name and drugs from EDL. The present study showed that rational prescription can be achieved in primary care level if policy makers take steps to make essential drugs and qualified staff available. Health care Interventions aimed at improving knowledge and training to staff in the issue of over prescription of antibiotics and in following a uniform prescription pattern designed by clinical regulatory authorities is highly advisable.

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