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Original Research Article

Prevalence of antimicrobial self-medication in paediatric patients

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Abstract: The practice of self-medication is common in India and many other parts of the world. It involves the use of medicines to treat certain ailments without consulting a medical practitioner and without any medical supervision. It has been reported that self-medication in children accounted for 38.5% of total drug use. Self-medication with antimicrobials is an emerging problem worldwide, especially in developing countries. It leads to the emergence of pathogenic resistance apart from other drug related problems. This was a descriptive analytical study conducted on 640 paediatric patients in the paediatric outpatients department of a MKCG Medical College, Berhampur, India. Patients with a history of use of an anti-microbial without a medical prescription in the previous 15 days were included in the study. The data was presented as frequency and percentages. The prevalence of antimicrobial self-medication in children was 27.03%. Highest prevalence of antimicrobial self-medication was observed in the school going, urban, male children belonging to literate parents with a single child. The commonest anti-microbial used for self-medication in the study was Azithromycin. The common reasons cited for self-medication were, lack of time for parents to go to a doctor and lack of affordability to see a physician. The most common symptom that led to self-medication was fever followed by common cold.
Keywords: Antimicrobial, self-medication, prevalence

INTRODUCTION:

Self-medication is defined as the utilization of drugs to treat self-diagnosed disorders or symptoms, or the irregular or continuous use of a prescribed drug for chronic or repeated diseases or symptoms [1]. It involves the use of medicines to treat certain ailments without consulting a medical practitioner and without any medical supervision. There is the lack of clinical assessment of the condition by a qualified medical professional. The practice of self-medication is common in India and many other parts of the world [2, 3]. Studies have observed the prevalence of self-medication in the adult population to be between 12.7% and 95% [4, 5]. Some studied have found that the prevalence of self-medication with all kind of drugs in children aged 0–17 years to be 25.2%. Self-medication by children accounted for 38.5% of total drug use [6]. Antimicrobials are a large group of diverse structures with myriad mechanisms of actions against bacteria, viruses, fungi, and parasites [7]. Among these bacteria cause most of the infectious disease. Chemotherapy of bacterial infections can be either empirical or definitive. Empirical therapy is the use of the antimicrobial agent based on the best guess of the most likely pathogen depending on the local antibiotic susceptibility pattern. This is instituted before the infecting organism is identified, but covers all the likely pathogens causing the infection. Definitive therapy depends on the isolation of the aberrant agent, categorization of the agent's susceptibility, and then using the suitable antimicrobial agent. The main problem with self-medication with antimicrobials is the emergence of pathogenic resistance. Antimicrobial resistance is an existing problem world-wide, mainly in developing countries, where antibiotics are often obtainable without prescriptions [8]. The increase in antibiotic resistance in

developing countries is of current public health concern as it results in multiple resistant organisms leading to infections that are not easy to treat [9]. Self-medication is also associated with a five times higher risk in the occurrence of drug related problems [5]. The determinants of self-medication with antibiotics in low-income countries mainly include, over-the-counter sale of antibiotics, the unaffordability of medical consultation, lack of agreement with medical practitioners, and misconception concerning the effectiveness of antibiotics [10-12]. Since, self-medication with antibiotics is a global health problem spread across continents and given the growing global resistance to antibiotics and the documented health problems related to their inappropriate use, there is a consensus that their indiscriminate use in children must be avoided [13,14]. With this background the present study was initiated to examine the prevalence of antimicrobial self-medication in children.

MATERIAL AND METHODS

This was a descriptive analytical study conducted in the paediatric outpatients department of a M.K.C.G Medical College, Berhampur, India during a six months period from June 2016 to November 2016. The hospital provides tertiary healthcare services and receives patients from about ten districts of south Odisha in India. Assuming a prevalence of 40% and a confidence level of 95% at a precision of 4, the sample size was calculated to be 576. To account for a non-responder rate of 10%, finally, 640 patients were included in the study. Convenience sampling technique was used to recruit the study participants. Parents or relatives of all the patients were interviewed regarding the patients' medication history during physical examinations. Patients with a history of use of antimicrobials without a medical prescription in the previous 15 days were included in the study and further information about the pattern antimicrobial use was collected and recorded in a pre-designed case record form. Patients who were very sick and critically ill were excluded from the study. The data was presented as frequency and percentages.

RESULTS

In the present study it was observed that out of 640 study participants 173 (27.03%) had done self-medication with one or more antimicrobial agents. Highest prevalence (53.75%) of self-medication was observed in the school going children ($p<0.0001$, 95% CI 49.80-57.67). Similarly, the use of self-medication was significantly higher in male children (56.06%) and those from an urban habitat (61.84%). The prevalence of paediatric self-medication was lower in children with illiterate parents and if they had more than two siblings. Most of the patients used one antimicrobial agent (88.43%, $p<0.0001$, 95% CI 85.69-90.80) for self-medication. In spite of self-medication, majority of the study participants reported no cure and in a significant number of cases under-dosing of the anti-microbial agent was observed. [Table 1] the commonest anti-microbial used for self-medication in the study was azithromycin (22.54%). Self-medication by albendazole was reported in 16.18% of the participants. [Table 2] In a significant number of subjects (39.88%, $p<0.0001$, 95% CI 36.06-43.49) the private retail pharmacy was the source of self-medication. [Table 3] In the study it was observed that 61.84% cases doing self-medication reported no cure ($p<0.0001$, 95% CI 57.95-65.62). [Table 4] The common reasons cited for self-medication were, lack of time for parents to go to a doctor and lack of affordability to see a physician, 20.23% in either case. ($p<0.0001$, 95% CI 17.18-23.55). [Table 5] The most common symptom that led to self-medication was fever (42.77%) followed by common cold (19.65%). [Table 6]

Table 1: Characteristic of self-medication with antimicrobial in children

Parameter	Number of patients n (%)	p value, CI (z-test)
Age of the child		
< 2 months (Early neonatal period)	9 (5.2)	p<0.0001, 3.61-7.22
2-12 months (Neonatal period)	32 (18.49)	p<0.0001, 15.56-21.72
12-36 months (Preschool)	21 (12.14)	p<0.0001, 9.71-14.92
36-60 months (Toddler)	18 (10.4)	p<0.0001, 8.14-13.03
5-14 years (School going)	93 (53.75)	p<0.0001, 49.8-57.67
Gender of the child		
Male	97 (56.06)	p<0.0001, 52.12-59.65
Female	76 (43.93)	p<0.0001, 40.04-47.87
Habitat		
Rural	66 (38.15)	p<0.0001, 34.37-42.04
Urban	107 (61.84)	p<0.0001, 57.95-65.62
Education level of parent		

Literate	90 (52.0)	p<0.0001, 48.05-55.93
Illiterate	83 (48.0)	p<0.0001, 44.07-51.95
Number of siblings		
<2	94 (54.33)	p<0.0001, 50.38-58.24
>2	79 (45.66)	p<0.0001, 49.75-49.61
Number of anti-microbial used		
1	153 (88.43)	p<0.0001, 85.69-90.80
>1	20 (11.56)	p<0.0001, 9.91-14.29
End point of treatment		
Completed full course but not cured	21 (12.13)	p<0.0001, 9.7-14.91
Reported in between with no cure	152 (87.86)	p<0.0001, 85.08-90.29
Dosing of the medication		
Under-dosing	101 (58.38)	p<0.0001, 54.45-62.23
Over-dosing	7 (4.04)	p=0.0002, 2.65-5.87
Appropriate dosing	65 (37.57)	p<0.0001, 33.8-41.45

Table 2: Antimicrobials used for self-medication in children

Anti-microbial agent	**Number of patients n (%)**	**p value, 95% CI (z-test)**
Anti-bacterial		
Azthromicin	39 (22.54)	p<0.0001, 19.36-25.98
Cefixime	32 (18.49)	p<0.0001, 15.56-21.72
Ofloxacin	18 (10.40)	p<0.0001, 8.14-13.03
Amoxicillin	11 (6.35)	p<0.0001, 4.59-8.53
Inj Ceftriaxone	13 (7.51)	p<0.0001, 5.59-9.83
Inj Cefotaxime	3 (1.73)	p=0.625, 0.87-3.07
Inj Amikacin	3 (1.73)	p=0.625, 0.87-3.07
Anti-protozoal		
Tinidazole	10 (5.78)	p<0.0001, 4.1-7.88
Metronidazole	3 (1.73)	p=0.625, 0.87-3.07
Chloroquine	3 (1.73)	p=0.625, 0.87-3.07
Artisunate	5 (2.89)	p=0.10, 1.74-4.5
Lumafantrine-Sulfadoxine	5 (2.89)	p=0.10, 1.74-4.5
Anti-helminths		
Albendazole	28 (16.18)	p<0.0001, 13.41-19.27

Table 3: Source of information of antimicrobial self-medication in children

Source of information	**Number of patients n (%)**	**p value, 95% CI (z-test)**
Previous prescription	48 (27.74)	p<0.0001, 24.3-31.38
Pharmacy	69 (39.88)	p<0.0001, 36.06-43.49
Friend	56 (32.36)	p<0.0001, 28.75-36.14

Table 4: Outcome of anti-microbial self-medication in children

Outcome	**Number of patients n (%)**	**p value, 95% CI (z-test)**
Partial cure	32 (18.49)	p<0.0001, 15.56-21.72
No cure	107 (61.84)	p<0.0001, 57.95-65.62
Progress to complication	27 (15.60)	p<0.0001, 12.87-18.65
Occurrence of adverse drug reaction	7 (4.04)	p=0.0002, 2.65-5.87

Table 5: Reasons for antimicrobial self-medication in children

Reasons for self-medication	**Number of patients n (%)**	**p value, 95% CI (z-test)**
Lack of time for parents to go to a doctor	35 (20.23)	p<0.0001, 17.18-23.55
Lack of affordability to see a physician	35 (20.23)	p<0.0001, 17.18-23.55
Perception that pharmacy is experienced enough	31 (17.92)	p<0.0001, 15.02-21.12
Non-availability health care centre	28 (16.18)	p<0.0001, 13.41-19.27
Perception that friend who often visit hospital is experienced	21 (12.13)	p<0.0001, 9.7-14.91
Lack of knowledge to differentiate a quack and a qualified physician	23 (13.29)	p<0.0001, 10.76-16.17

Table 6: Symptoms that led to antimicrobial self-medication in children

Symptoms	**Number of patients n (%)**	**p value, 95% CI (z-test)**
Fever	74 (42.77)	p<0.0001, 38.9-46.71
Common Cold	34 (19.65)	p<0.0001, 16.64-22.94
Cough	31 (17.91)	p<0.0001, 15.01-21.10
Loose Motion	14 (8.09)	p<0.0001, 6.1-10.48
Pain Abdomen	12 (6.93)	p<0.0001, 5.09-9.18
Skin Rashes	5 (2.89)	P=0.107, 1.74-4.5
Joint Pain and swelling	3 (1.73)	p=0.624, 0.87-3.07

DISCUSSION

The present study shows that 27% of the paediatric patients reporting to the paediatric O.P.D of tertiary care hospitals were on antimicrobial self-medication. Some other studies done in Yemen, Jordan, Sudan, and Europe have reported the prevalence of anti-microbial self-medication to be as high as 60% of the patients [15-19]. This difference in the prevalence may be due to the difference in the health care and socioeconomic setting of the countries. In this study, it was observed that children less than two months were less predisposed to antimicrobial self-medication. Similar was the observation in some other studies, where they have reported that parents or relatives did not use self-medication with antibiotics for children below three months without a medical consultation [16]. This may be due to the fact that parents or relatives were hesitant to give antibiotics to very young infants and children or may be due to the reason that the pharmacists sometimes refuse to give antibiotics to very young children. The use of self-medication was significantly higher in male children. Other studies have also reported that self-medication is common in male children than females [16]. This may be due to the social preference of a male child for which the parents seek the treatment earlier than a female child. An urban bias towards antimicrobial self-medication observed in this study may be due to the easy availability and accessibility to a pharmacy in the urban areas as compared to the rural. The prevalence of paediatric self-medication was lower in children with illiterate parents and if they had more than two siblings. This may be due to the apprehension and fear by the illiterates that use of medication without a consultation could lead to further deterioration of the clinical condition.

Most of the patients used one antimicrobial agent for self-medication and under-dosing was common. Under dosing is a serious problem in antimicrobial therapy as it invariably leads to emergence of drug resistance, relapse, masking of the clinical condition etc. In spite of self-medication majority of the study participants reported no cure. In another study it was observed that many parents or relatives of the patients used only one or two doses of antibiotics, if the symptoms did not improve, then they consulted a physician [16]. Some studies have reported the most common antimicrobial used for self-medication were amoxicillin, trimethoprim-sulfamethoxazole and amoxicillin-clavulanic acid. This is in contract to the observations of the present study where the commonest antimicrobial for self-medication was azithromycin. In this study, the private retail pharmacy was the source of self-medication. Other

studies have reported a similar observation, where about 74% study subjects obtained the antibiotics from pharmacies and drug stores without any prescription and 26% patients used the previous prescription paper to obtain antibiotics [16]. This may be a way adapted to reduce the cost and to pay only for drugs, procured either directly from pharmacies and drug stores or using the previous medical prescription paper. This may lead to many problems, like, the misuse of antibiotics, augmenting of the cost due to complications etc. It was also observed that many parents or relatives of the patients used only one or two doses of antibiotics, if the symptoms did not improve, then they consulted a doctor and for which they incur additional expenditure for consultation, investigation and new drugs. In the study it was observed that about 60% cases doing self-medication reported no cure. This may be due to the inappropriate choice of the antimicrobial agent or use of an antimicrobial for a viral infection. The common reasons cited for self-medication were, lack of time for parents to go to a doctor and lack of affordability to see a physician. In a similar study done in Yemen it was observed that due to the inability to afford a doctor consultation and laboratory investigations a majority of families directly go to pharmacies and drug stores for self-medication [16]. The most common symptom that led to self-medication was fever followed by common cold. This is similar to the findings of other studies where they have reported that antimicrobial self-medication was commonly used for minor ailments and viral infections such as common cold and upper respiratory tract infections which are often treated with antimicrobials [15, 20]. In a study done in Indonesia, the commonest disease condition cited for self-medication was respiratory and gastro intestinal symptoms [21]. One of the major limitations of the present study is that, it is confined to the patients reporting to the O.P.D of a tertiary care hospital, it does not reveal the situation of antimicrobial self-medication in paediatric age group outside the hospital setting.

CONCLUSION

The prevalence of anti-microbial use in children without medical prescription is high keeping in view the vulnerability of this group towards the drug related problems. Antimicrobial self-medication depends on the parents' education level, past experiences and socio-demographic condition. Self-medication frequency was found to be high among specific age groups like school going and male children. The public health policy implications of this study are that, since, universal access to the health care and easy availability essential medicines have been postulated to reduce the prevalence of antimicrobial self-medication in adults; this could be the same for children. Pharmacies that are often the first point of contact between the patient and the health care system in a developing country should be equipped to promote rational drug use in the community.

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