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ORIGINAL RESEARCH

A Study on Pediatric Pharmacovigilance in a Tertiary care Hospital

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ABSTRACT

Background: To assess Pediatric pharmacovigilance in tertiary care hospital.

Material and Methods: Fifty-six children with Adverse drug reactions (ADRs) of both genders were selected. Causality assessment of ADRs was done by WHO-UMC system of causality assessment scale. The severity of the ADRs was assessed by modified Hartwig and Siegel scale. Preventability of the ADRs was assessed by modified Schumock and Thornton scale.

Results: Out of 56 children, 30 (53.5%) were males and 26 (46.5%) were females. Age group 0-6 years had 10, 7-12 years had 24 and 13-17 years had 22 cases. The difference was significant (P< 0.05). In ADR, class of drugs involved was, anti-emetics in 1, anti-psychotics in 2, NSAIDS in 7, steroids in 10 and anti-microbials in 36 cases. Organ involved was musculoskeletal in 12, oral cavity in 18 and dermatological in 26. WHO causality scale found to be certain in 16, probable in 30 and possible in 10. Modified Hartwig and Siegel scale was mild in 34 and moderate in 22. Modified Schumock and Thornton scale was preventable in 56 cases. The difference was significant (P< 0.05).

Conclusion: The role of pediatric pharmacovigilance in monitoring the safety of drugs among children is of paramount importance for the detection of newer and rarer ADRs. In maximum cases, adverse drug reactions were seen in children with anti-microbials.

Keywords: Adverse drug reactions, Anti-microbials, Children, Pharmacovigilance.

INTRODUCTION

Adverse drug reactions (ADRs) have been defined by the World Health Organization as ‘‘a response to a drug that is noxious and unintended and occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease, or for modification of physiological function’’.[1,2] Monitoring and documentation of ADRs are crucial to ensure the safe use of medications.[3]

Adverse drug reaction (ADR) monitoring centers (AMCs) have been set up under Pharmacovigilance Programme of India (PvPI) which collect report and follow-up ADR occurring in patients.[4] The PvPI collates the data received from various AMCs and recommends regulatory interventions, besides communicating risks to health-care professionals and the public.[5] These centers are set up in medical colleges and hospitals across the country where the information is collected from multiple sources and reported as

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per standard operating procedure guidelines. The data collected are entered and reported to National Coordination Centre (NCC) through VigiFlow (version 5.3), (Uppsala Monitoring Centre, Uppsala, Sweden).[6]

Children are more at risk of having ADRs because many drugs which are prescribed to this population have been marketed with limited or no experience of their efficacy and safety. There are only very few clinical trials which have focused on the efficacy and safety of drugs involving children.[7,8] We performed this study to assess Pediatric pharmacovigilance in tertiary care hospital.

MATERIAL & METHODS

After considering the utility of the study and obtaining approval from ethical review committee, we selected fifty- six children with ADR of both genders. Parents' consent was obtained before starting the study.

Data such as name, age, gender etc. was recorded. ADRs were classified on the basis of Anatomical and Therapeutic Classification System (ATC 1999). Causality assessment of ADRs was done by causality assessment scale proposed by the WHO Collaborating Centre for International Drug Monitoring, the Uppsala Monitoring Centre (WHO), which classify suspected ADRs as certain, probable, possible, unlikely, conditional/unclassified, and assessable/unclassifiable. The severity of the ADRs was assessed by modified Hartwig and Siegel scale which gives an impression of the severity of ADRs and tags it as mild, moderate, or severe. Preventability of the ADRs was assessed by modified Schumock and Thornton scale. This scale of preventability classifies ADRs as definitely preventable, probably preventable, and not preventable. The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

RESULTS

Table I Patients distribution

Total- 56		
Gender	**Males**	**Females**
Number (%)	30 (53.5%)	26 (46.5%)

Out of 56 children, 30 (53.5%) were males and 26 (46.5%) were females (Table I).

Table II Age group wise distribution

Age group (years)	Number	P value
0-6	10	0.05
7-12	24	
13-17	22	

Age group 0-6 years had 10, 7-12 years had 24 and 13-17 years had 22 cases. The difference was significant (P< 0.05) (Table II).

Table III Assessment of parameters

Parameters	Variables	Number	P value
Drugs	Anti- emetics	1	0.01
	Anti- psychotics	2	
	NSAIDS	7	
	Steroids	10	

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	Anti- microbials	36	
Organ involved	Musculoskeletal	12	0.05
	Oral cavity	18	
	Dermatological	26	
WHO Casuality scale	Certain	16	0.05
	Probable	30	
	Possible	10	
Modified Hartwig and Siegel scale	Mild	34	0.04
	Moderate	22	
Modified Schumock and Thornton scale	Preventable	56	-

In ADR, class of drugs involved was, anti-emetics in 1, anti-psychotics in 2, NSAIDS in 7, steroids in 10 and anti-microbials in 36 cases. Organ involved was musculoskeletal in 12, oral cavity in 18 and dermatological in 26. WHO causality scale found to be certain in 16, probable in 30 and possible in 10. Modified Hartwig and Siegel scale was mild in 34 and moderate in 22. Modified Schumock and Thornton scale was preventable in 56 cases. The difference was significant (P< 0.05) (Table III).

DISCUSSION

Underreporting of ADRs is a significant problem worldwide.[9] There is significant variation between different countries in relation to the number of ADRs reported.[10] The Uppsala Monitoring Centre receives data from national pharmacovigilance centres of >100 countries.[11,12] We performed this study to assess Pediatric pharmacovigilance in tertiary care centre.

In our study, out of 56 children, 30 (53.5%) were males and 26 (46.5%) were females. Barzaga et al[13] described the adverse drug reactions (ADRs) detected following increased education about pharmacovigilance and drug toxicity in children. There were 533 reports involving suspected ADRs in children in the period. Almost one third of the reports received were classified as moderate (155, 29%) or severe (10, 2%). There was one fatality in association with the use of ceftriaxone. Vaccines and antibiotics were responsible for most of the ADR reports (392, 74%) and for all ten severe ADRs. After an intensive educational package, both within the community and the Children's Hospital, the number of reports increased from 124 in 2008 to 161 in 2009 and 372 in 2010. This was equivalent to a reporting rate of 879 and 2,031 reports per million children per year for 2009 and 2010, respectively

Our results showed that age group 0-6 years had 10, 7-12 years had 24 and 13-17 years had 22 cases. Clavenna et al[14] assessed the incidence of adverse drug reactions (ADRs) in the pediatric population. A total of eight prospective studies were evaluated, six of which concerned the ADR incidence in hospitalized children. The overall incidence of ADRs was 10.9% (95% CI 4.8 to 17.0) in hospitalized children and 1.0% in outpatient children. The rate of hospital admission due to ADRs was 1.8%. The skin and gastrointestinal system were the organs most commonly affected and antibiotics were the drugs most commonly associated with ADRs. Safety alerts in the pediatric population were retrieved for 28 drugs, five of which were for psychotropic drugs and most of which were issued by the Food and Drug Administration (20 drugs). For 12 drugs, warnings were published in the 2006-2007 period. Antidepressants were the only drugs for which alerts were issued by all the drug regulatory agencies.

Our results showed that in ADRs, class of drugs involved was, anti-emetics in 1, anti-psychotics in 2, NSAIDS in 7, steroids in 10 and anti-microbials in 36 cases. Organ involved

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was musculoskeletal in 12, oral cavity in 18 and dermatological in 26. WHO causality scale found to be certain in 16, probable in 30 and possible in 10. Modified Hartwig and Siegel scale was mild in 34 and moderate in 22. Modified Schumock and Thornton scale was preventable in 56 cases. Sharma et al[15] assessed determined the nature and severity of adverse drug reactions (ADRs) in pediatric patients. There were total of 20 pediatric ADRs reported during this period. Nearly two-thirds of the ADRs occurred in patients who were receiving multiple drugs (polytherapy). Antimicrobials were the most commonly implicated drugs. The most common ADRs were skin rash (maculopapular, erythematous, and urticaria, itching, etc.). The severity and preventability scales indicated that most reactions (18/20) were moderate in nature and all were preventable. Four reactions were "certainly" and ten ADRs were "probably" related to the suspected drug as determined by the WHO causality assessment.

Holdsworth et al[16] determined the incidence and causes of adverse drug events (ADEs) and potential ADEs in hospitalized children, and to examine the consequences of these events. A total of 1197 consecutive patient admissions were studied. The ADEs (6/100 admissions, 7.5/1000 patient-days) and potential ADEs (8/100 admissions, 9.3/1000 patient-days) were common in hospitalized children. Demographic variables associated with the occurrence of these events were the length of hospital stay, case-mix index, and amount of medication exposure. After adjusting for length of stay, medication exposure continued to have a significant influence on ADEs and potential ADEs. For ADEs, 18 (24%) were judged to be serious or life threatening. Most ADEs were not associated with major or permanent disability. Patients with both ADEs and potential ADEs were less likely to be routinely discharged and more likely to be discharged with home health care or to another institution, suggesting that patient disposition was not related to the adverse event.

CONCLUSION

The role of pediatric pharmacovigilance in monitoring the safety of drugs among children is of paramount importance for the detection of newer and rarer ADRs**.** In maximum cases, adverse drug reactions were seen in children with anti-microbials.

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ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 03, 2023

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