

Parental Reporting Of Suspected Adverse Drug Reactions In Children

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Abstract

Objective: This study aimed to assess the viability of parents reporting suspected adverse drug reactions (ADRs) to community pharmacies .

Methods: Fifteen registered pharmacies were randomly selected Caregivers who purchased antibiotics, antimalarials, paracetamol, or ibuprofen for children up to 12 years old from these pharmacies between July and September 2007 were asked to report any suspected ADRs in their child by completing a questionnaire provided by the pharmacist. If caregivers suspected an ADR within 5 days of administering the medicine, they were requested to return the completed questionnaire within the following 7 days.

Results: A total of 9023 drugs were purchased for 2868 children, with 1807 (63%) being male, and 689 (8%) of the drugs were administered by injection. Antibiotics (1975, 24%) were the most frequently purchased drugs among the surveyed categories (antibiotics, antimalarials, paracetamol, and ibuprofen), with chloroquine (445, 46%) being the most common¹y purchased antimalarial. Among the reported drugs, 509 (18%) caregivers reported 575 suspected ADRs, primarily mild ones (509 related to antibiotics, 42 to antimalarials, and 24 to analgesics). The most commonly reported suspected ADRs were diarrhea in 292/575 (51%) children and skin rashes in 103/575 (18%). The overall prevalence of ADRs in these children was 509/2868 (18%).

Conclusion: The study concludes that parental reporting of suspected ADRs related to antibiotics, antimalarials, and analgesics in their children is feasible . This approach to pharmacovigilance should be expanded and utilized more extensively.

Introduction

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Background

Adverse drug reactions (ADRs) among children pose a significant challenge. Despite this, many ADRs go unnoticed or unreported. To address this issue, a National Pharmacovigilance Centre (NPC) has been established within National Agency for Food and Drug Administration and Control (NAFDAC) to raise awareness about ADRs among the public and encourage individual reporting. For example, the monitoring of dipyron in the market by NAFDAC agencies, along with several reports of fatal ADRs, resulted in its withdrawal from the market. (Ashorn et al., 2002)

Previous studies on ADR reporting have primarily involved healthcare professionals like doctors, pharmacists, and nurses, with limited focus on spontaneous reporting by patients. However, patient reporting of ADRs is accepted in countries such as the USA, the Netherlands, Denmark, the UK, and Sweden. Studies from the Netherlands comparing ADR reporting by patients and healthcare professionals to the Netherlands Pharmacovigilance Centre have shown similar patterns in the most frequently reported ADRs and the implicated drugs. This highlights the potential of spontaneous ADR reporting by patients to enhance pharmacovigilance efforts significantly. (Odusanya, 2002)

There is a lack of epidemiological studies on ADR reporting by parents concerning children, unlike the reporting of ADRs in adults. The feasibility and reliability of parents or caregivers reporting suspected ADRs in children have not been extensively studied. However, a prospective study on midazolam withdrawal in critically ill children noted that parents were instrumental in identifying abnormal reactions in some cases. (Passier et al., 2006)

In developing countries, self-medication and the procurement of prescription-only medicines without prescriptions are common issues, driven by factors such as inadequate policies on rational drug use, limited access to quality healthcare facilities, and economic challenges. Parents often resort to self-medication for their children due to various reasons, including dissatisfaction with public healthcare services, time constraints, and the high cost of consultations in private hospitals. (Golomb and Evans, 2006)

Antibiotics and antimalarials are frequently associated with ADRs in children and are easily accessible with or without prescriptions, leading to their self-medication by parents. Paracetamol is commonly used as an analgesic and antipyretic for children. In, caregivers typically obtain medications for their children from community pharmacists, given the absence of a national health insurance policy for the general population. (Ezechukwu et al., 2005)

Therefore, this study aimed to investigate the drug usage patterns in children and assess the feasibility and reporting rates of suspected ADRs related to antibiotics, antimalarials, and analgesics by their caregivers to community pharmacies. (van Grootheest et al., 2005)

METHODS

Data Collection

A registry was maintained in each pharmacy to gather information from caregivers purchasing medicines for children up to 12 years old between 8:00 am and 8:00 pm daily, except Sundays, over a 3-month period. Trained research assistants explained the study to caregivers, excluding those only purchasing over-the-counter (OTC) drugs like cough syrups and multivitamins. Informed consent and basic demographic details about the child (age, gender, types of medicines purchased) and the caregiver (occupation, education level, source of drug prescription, adverse reactions to procured medicine) were collected from eligible caregivers.

Pharmacists determined the dosage and duration of non-prescription medicines and relayed this information to caregivers.

ADR Surveillance

Medications were categorized into antibiotics, antimalarials, analgesics, and OTC drugs. A questionnaire, developed after an extensive literature review on ADR reporting in both adults and children, focused on antibiotics, antimalarials, and analgesics due to their previously reported high incidence of ADRs in children. Caregivers were provided with a comprehensive list of previously documented symptoms/ADRs, akin to a British study on parental ADR reports for specific medications. If caregivers suspected an ADR within 5 days, they were instructed to return the questionnaire within 7 days, with space for additional comments on unlisted ADRs.

Reporting and Analysis

Illiterate caregivers could directly report observed ADRs to pharmacists or research assistants, noted on the questionnaire. Severe ADR cases were referred to government hospitals, and all ADRs were reported to the National Pharmacovigilance Centre. Data analysis utilized SPSS v 13 for simple descriptive statistics.

RESULTS

Participant Enrollment

During the 3-month period, 3954 caregivers visited the pharmacies to obtain drugs. Of these, 88 (2.2%) declined participation, leaving 3866 consenting participants, among whom 2868 (74%) met the inclusion criteria.

Demographics of Children and Caregivers

Drugs were procured for 2868 children aged 1 month to 12 years (mean age 5.6 years with an SD of 3.8), with 1807 (63%) being male. Parents predominantly procured drugs, with other relatives doing so in one-third of cases. Regarding education, 2264 (79%) caregivers had secondary-level education or higher, while 100 (4%) had no formal education.

Types of Drugs Procured and Prescribers

Most caregivers (2107, 74%) procured three or more drugs. Self-medication by parents was the primary reason for drug acquisition, while healthcare providers recommended drugs in 35% of cases. Over the study period, a total of 9023 drugs were procured, including 689 (7.6%) administered by injection, with paracetamol (3%), chloroquine (2%), artemether (1%), and ampicillin (0.3%) being the most common.

Drugs Grouped by Type

The drugs procured for children were categorized into antibiotics, antimalarials, analgesics, and OTC drugs. Ampicillin/cloxacillin (21%), amoxicillin (17%), and cotrimoxazole (12%) were the top antibiotics procured, while chloroquine (46%), artesunate (26%), and sulphadoxine with pyrimethamine (17%) were frequently obtained antimalarials. Analgesics, including paracetamol (11%) and ibuprofen (2%), were less frequently procured.

Reporting of Suspected ADRs

Overall, 509 (18%) caregivers reported 575 suspected ADRs to the pharmacies, with multiple ADRs suspected in 14 children. Diarrhoea (51%) and skin rashes (18%) were the most

commonly reported suspected ADRs. Ampicillin/cloxacillin (8%) led in suspected ADRs among antibiotics, followed by ampicillin (4%) and amoxicillin with clavulanic acid (2%). Specific additional suspected ADRs reported included dryness of the body, pallor, high temperature, peeling of the skin, yellow eyes, and facial swelling.

Table 1: Those Recommending the Procured Drugs for Children

Recommender	Frequency	Percentage
Parents and family	1121	39
Pharmacist	501	18
Nurse	464	16
Medical doctor	321	11
Family friends and neighbours	309	10
Traditional birth attendants	107	4
Laboratory technologist	45	2
Total	2868	100

Table 2: Drugs Procured, Formulation, and Suspected Adverse Drug Reactions

Drug Class	No. of Children Procured Drugs	No. of Procured Oral Drugs	No. of Procured Injections	No. of Suspected ADRs
Antibiotics	1512	1947	28	509
Antimalarials	968	1025	262	42
Analgesics	984	912	281	24
OTC Drugs	2588	4450	118	0
Total	2868*	8334	689	575

Table 3: Symptoms/Suspected Adverse Drug Reactions Reported by Caregivers

Symptoms/Suspected ADR	No. of Suspected ADRs	Likely Drug Causing Suspected ADR
Diarrhoea	292	Ampicillin/cloxacillin (98), ampicillin (65), amoxicillin (47), amoxicillin/clavulanic acid (35), cefuroxime (21), cephalexin (12), cotrimoxazole (5), azithromycin (3), paracetamol (3), artesunate (1), sulphadoxine/pyrimethamine (1), ibuprofen (1)
Skin rash	106	Ampicillin/cloxacillin (38), cotrimoxazole (30), ampicillin (25), cephalexin (5), sulphadoxine/pyrimethamine (4), artesunate (2), chloroquine (1), paracetamol (1)

Tiredness	29	Ampicillin/cloxacillin (9), amoxicillin/clavulanic acid (6), cefuroxime (5), cephalexin (5), artesunate (3), paracetamol (1)
Irritability	27	Amoxicillin (7), cefuroxime (5), cephalexin (5), ampicillin/cloxacillin (4), amoxicillin/clavulanic acid (2), cotrimoxazole (2), paracetamol (1), artesunate (1)
Pallor	18	Ampicillin/cloxacillin (6), ampicillin (3), amoxicillin (3), erythromycin (2), cefuroxime (2), cephalexin (1), amoxicillin/clavulanic acid (1)
Insomnia	17	Chloroquine (6), artesunate (3), ampicillin (3), amoxicillin (2), cefuroxime (2), amoxicillin/clavulanic acid (1)
Itchy skin	17	Chloroquine (5), ampicillin/cloxacillin (4), amoxicillin (3), sulphadoxine/pyrimethamine (2), ampicillin (1), cotrimoxazole (1), ibuprofen (1)
Vomiting	15	Chloroquine (3), amoxicillin (3), erythromycin (3), quinine (2), cephalexin (1), cotrimoxazole (1), paracetamol (1), ibuprofen (1)
Hyperactivity/excitability	12	Ampicillin/cloxacillin (5), ibuprofen (3), amoxicillin/clavulanic acid (2), azithromycin (1), paracetamol (1)
Cough	8	Azithromycin (2), erythromycin (2), amoxicillin (2), paracetamol (2)
Abdominal pain	7	Ampicillin/cloxacillin (3), cephalexin (2), ibuprofen (2)
Headache	7	Amoxicillin (3), artesunate (3), azithromycin (1)
Fever	6	Ampicillin/cloxacillin (2), azithromycin (2), cefuroxime (2)
Skin exfoliation	5	Sulphadoxine/pyrimethamine (3), chloroquine (1), artesunate (1)
Jaundice	5	Paracetamol (5)
Wheeze	3	Cephalexin (2), amoxicillin (1)
Facial swelling	1	Ibuprofen (1)

Discussion

Parental practices such as self-medication and polypharmacy have been identified as risk factors for adverse drug reactions (ADRs) in children, a concern also observed . In our study, a significant proportion of parents and caregivers engaged in self-medication (65%) and polypharmacy (74%), putting children at risk of ADRs. However, we acknowledge a limitation

in our study as we did not investigate the specific indications for the drugs procured, which could have provided insight into the reasons behind suspected ADRs. (Oshikoya et al., 2007)

Our study population skewed towards boys (63%), potentially reflecting societal preferences favoring male children. This observation aligns with gender-related disparities noted in other contexts, impacting areas such as nutrition, immunization, and accident rates among children. The preference for injections over oral drugs among parents, although unsupported by medical evidence, was evident in our findings, with 8% of parents procuring injections without a doctor's prescription. While no suspected ADRs to injections were reported, the practice poses risks such as infections from contaminated needles. (Fehintola, 2005)

Notably, over-the-counter (OTC) medicines, primarily multivitamins and vitamins B and C, constituted the most frequently procured drugs (51%). These OTC medications are typically not associated with significant ADRs and were thus not a focus of our study. Antibiotics were procured more frequently than antimalarials, which is surprising given malaria's prevalence in Lagos. This may indicate inappropriate self-medication practices, contributing to antibiotic resistance. (Blenkinsopp et al., 2006)

Our study reported suspected ADRs in 18% of caregivers, a lower rate compared to similar studies. This discrepancy could be attributed to the requirement for caregivers to physically return to the pharmacy to report ADRs, unlike studies where reporting was via mail. The study also highlighted fewer reports of ADRs related to antimalarials and analgesics, possibly due to these drugs being stocked at home in anticipation of common illnesses. (Oshikoya et al., 2008)

The inclusion of a symptoms checklist and open comments section in our questionnaire proved valuable in identifying potential unusual ADRs. Patients have been instrumental in reporting atypical ADRs in other populations, emphasizing the importance of patient input in pharmacovigilance. Parental reporting, while potentially overlapping with symptoms of treated illnesses, could enhance signal detection for ADRs. (Stewart et al., 2005)

This pilot study demonstrates the feasibility of parental reporting for suspected ADRs in children. Expanding this study to include other drugs and regions in would provide broader insights. Early detection and reporting of ADRs by involving parents can play a vital role in preventing ADR occurrences in the general population. (Ezechukwu et al., 2005)

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