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A comparative approach of medical professionals towards pattern of drug prescription for acute diarrhoea in children

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Abstract

The interactions between 1334 children with diarrhoea and medical professionals (32 paediatricians and 68 family physicians) were studied. More over half (51%) of GPs and 67% of paediatricians recommended oral rehydration salt (ORS) in encounters involving more than 500 patients. More than 40% of primary care physician visits and 42% of paediatricians visits involved the prescription of an antibiotic, 65% of primary care physician visits involved the prescription of an antidiarrheal medication, and 42% of primary care physician visits and 36% of paediatricians visits involved the prescription of an antimicrobial medication. When we analysed all of the visits, we found that general practitioners (GPs) and paediatricians (paediatricians) prescribed ORS in 55 and 53% of visits, antibiotics in 44 and 39%, antidiarrheals in 47 and 32%, and antimicrobics in 29 and 24%. Cotrimoxazole was among the most commonly recommended antimicrobial drug by both primary care physicians and specialists. In general practise, antidiarrheals were prescribed more frequently than in Paediatric practise. Seventy-seven percent of the time, primary care physicians used "mixtures," or home-made medication preparations. Patient visits with paediatricians lasted an average of 8 +/- 3 minutes, while visits with general practitioners lasted an average of 4 +/- 1 minutes. These findings point to an issue with under-prescribing ORS and over-prescribing antibiotics, anti-amoeba drugs and anti-diarrhea drugs. Prescription habits of these populations require careful planning of intervention techniques.

Keywords: Paediatricians, general practitioner, drugs, childhood diarrhoea, practices

Introduction

Congenital Hypothyroidism (CH) is one of the most common preventable causes of mental In third world countries, diarrhoea is a leading cause of illness and death among children. Recent estimates place the annual number of diarrhoea cases in children under the age of five at one billion, with 3.3 million associated fatalities ^[1]. Over the previous two decades, one million fewer children under the age of five have died as a result of diarrhoea ^[1]. Oral rehydration therapy has been widely disseminated as a cornerstone in the treatment of diarrhoea, and this has contributed to a considerable decline in the disease's fatality rate. Antidiarrheals, antimicrobics, and antibacterials play a little role in diarrhoea treatment according to World Health Organisation standards ^[2]. Despite this, reports continue to come in from many developing nations about the inadequate utilisation of oral rehydration salt (ORS) and the abuse of antidiarrhoeals, antimicrobics, and antibacterials. In Mexico, ORS has been used in 33% of diarrhoea prescriptions ^[3], in Peru it was prescribed in 48% of diarrhoea prescriptions ^[4], and in Bangladesh it was prescribed in 40%-70% of diarrhoea prescriptions ^[5]. In Mexico, 79% of prescriptions ^[3, 4], 58% of prescriptions ^[4, 6], and 94% of medications ^[3, 6] were for antibiotics. It is unknown how often ORS, antidiarrheals, and antibiotics are prescribed for children with diarrhoea. The use of loperamide in children is currently prohibited ^[9]. In 1990, antibiotics accounted for an estimated US \$ 120 million in costs, or 46% of total medicine sales ^[10]. Hospitals on the district, provincial, and national levels are all part of a country's public health system. Although care is offered at no cost to patients, government-run medical centres sometimes fall short ^[11] due to a shortage of resources such as pharmaceuticals, lab equipment, and trained medical personnel. Given these circumstances, private practise has emerged and thrived as the system's backbone.

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The vast majority of doctors have day jobs at hospitals or clinics and see private patients in the evenings. Many doctors, however, work independently of either the public or private sectors. These independent doctors do not serve a regular clientele because they do not keep records on their patients. Patients often get to decide which physician (primary care physician or specialist) they see.

General practitioners and specialists have different methods. Most paediatricians who specialised in consulting have assistants and a comfortable, patient-only waiting area in their offices. Patients can schedule an appointment for a consultation, but walk-ins are also accepted. While general practitioners do refer some cases to paediatricians, the vast majority of patients walk in off the street. These professionals issue prescriptions to patients, which can be filled at whatever pharmacy the patient chooses. Consultations cost between \$ 5 and \$ 10 USD. Qualification, length of practise, and having a teaching assignment at a medical college are only a few of the elements that affect the overall number of patients treated. In contrast, most family doctors' offices are only a single large room with a few wooden panels separating the waiting area from the pharmacy. Most of these family doctors do not employ secretaries. Nurse aides are used to administer injections and medication to patients. It's unclear whether or not these careers have completed official training. The

doctor sits across a table, with patients lined up in front of him or her. The doctor-patient consultation has almost no personal space. In addition to counselling, these family physicians often distribute medication for a little fee of US\$0.5 to US\$1.0. Prescription fees are typically waived if the doctor does not administer any medication. In addition, patients can purchase medications in pharmacies with or without a prescription, depending on the patient's preference and financial situation. Paediatricians are believed to prescribe more sensibly than general practitioners (GPs) because they have specialised training in the treatment of children. Despite reports of inadequate and incorrect use of ORS and excessive consumption of various medicines among kids with diarrhoea [12, 13], we were unable to locate any literature that distinguished between the behaviours of general practitioners and paediatricians in treating this condition. National health policymakers need this information in order to alter the way doctors and nurses behave.

Methods

No reliable data exists on the total number of family physicians in the UAE. We estimate that there are more than 6500 GPs in active practise. Between four hundred thirty and two hundred paediatricians are employed.

Table 1: Prescribing practices for childhood diarrhoea

No of encounters depicting the characteristics of diarrhoea				
	GPs		Paediatricians	
	N	%	N	%
Total no of encounters	643	100	398	100
Stool frequency	396	66	324	85
Duration of Diarrhoea	408	68	311	79
Type of diarrhoea				
Watery or non-watery	478	78	309	81
Presence or absence of blood	320	51	223	59

We tried to get a list of active GPs from a few different places but were unsuccessful. Although each GP has registered, their actual place of practise and current address are not documented. Typically, drug manufacturers will have up-to-date contact information for doctors and other medical professionals. Therefore, many pharmaceutical firms were contacted in an effort to compile the most extensive database of primary care physicians conceivable. However, one of them did contain the addresses of almost 2,600 doctors who were actively seeing patients. Given that they didn't sell any diarrhoea medicine, we rolled the dice and picked general practitioners at random from among these names. A sample of paediatricians was drawn at random. These doctors were apprised that the purpose of the study was to gather data about Paediatric issues that their patients were experiencing. Nonetheless, they were not informed of the study's intended outcomes. This was done so as to lessen the impact that having an observer present would have on their prescribing habits. All of those watching had sociology degrees. They had a month of training in data collection and observation techniques. During this time period, these observers were dispatched to the offices of non-study general practitioners and paediatricians to watch their procedures. Every day, they had their records reviewed for accuracy, and they were given feedback and suggestions on how to improve. This

month was spent performing preliminary testing and making adjustments to the data collection forms. We assumed a 32% difference in the percentage of antibacterials and antidiarrheals prescribed by GPs and paediatricians because there is no published evidence about differences in the practising behaviour of these two groups. During April and December of 2022, 98 randomly selected doctors and nurses were analysed. Twenty-seven paediatricians (85%) and thirty-eight family physicians (53%) had been in practise for more than ten years. The observer sat in the doctor's office and watched as the doctor interacted with patients, taking notes on the data collecting forms. Apart for the qualitative information, all of these forms had been coded before analysis. Patients' ages and sexes were recorded, as was their medical history (including any episodes of vomiting, fever, or cough), the medications they were prescribed or dispensed, and the length of their consultation with their doctor.

Results

As a result, 100 practitioners and 1334 diarrheic children had their interactions documented. Of these, 643 were with the 68 family physicians and 398 were with the 32 paediatricians. 25-55% of visits had insufficient stool history taken by clinicians or reported by parents (Table I) about stool frequency, duration, and type as well as the existence

or lack of blood in the stool. Even in the rare cases where parents were given a diagnosis, like congested throat, chest trouble, gastroenteritis, etc., the information was exceedingly generalised. Therefore, there was no way to link the diagnosis with the care provided. Taking a cue from Divine, *et al.* [14], we examined prescribers' habits in isolation. Here, we zeroed in on four factors: Oral rehydration salts (ORS) prescription, antidiarrheal prescription, antiamoebic prescription, and antibacterial prescription. More than half of doctor visits and all Paediatric visits required ORS prescriptions to be judged sufficient. High prescribers were those who prescribed antibiotics, antidiarrheals, and antiamoebics in over thirty percent of their contacts, while low prescribers prescribed these treatments in no more than thirty percent of their patient visits. Based on the reported frequency of blood in faeces (10% of all encounters) and fever and cough (62% of all encounters), a threshold of 33% was chosen. Antibacterial therapy is not necessary for more than 23% of patients, per the recommendations of the National ARI Control Programme [15]. With 581 encounters reporting fever and cough, only 130 (15%) should have required antibiotic medication. Antibacterial therapy was considered to not have been necessary in more than 32 percent of cases with diarrhoea, using a more permissive stance. The number of visits to primary care physicians and paediatricians who recommended ORS and other medicines is shown in Table 2. The percentage of general practitioners and paediatricians who prescribe ORS appropriately does not differ significantly. Despite the fact that ORS was prescribed in 57% of GP visits and 55% of paediatricians encounters, directions for preparing ORS were supplied in just 9% of GP encounters and 9.4% of paediatricians encounters. Also, general practitioners (GPs) only gave recommendations for ORS dosing in 13% of visits, whereas paediatricians gave recommendations in 18% of encounters. Particularly in the administration of antidiarrheals was there a statistically significant difference between GPs and paediatricians, with GPs prescribing more than twice as many of these medications as paediatricians (chi-square 6.31, $p < 0.01$). Family physicians prescribed antibiotics at a rate somewhat higher than paediatricians (chi-square 21.78, $p < 0.16$).

Table 2: No of GPs and paediatricians prescribing ORS

	GPs		Paediatricians	
	Q > N	%	N	%
ORS	37	54.1	19	61.5
Antidiarrhoeals	42	61.2	9	29.2
Antiamoebics	29	39.8	11	33.4
Antibacterials	46	67.3	17	52
Injectables	24	33.1	7	18.4

Note: More than one drug with or without ORS had been suggested in each encounter

Table 3 displays the total number and proportion of GP and paediatricians contacts in which various medications were dispensed. Kaolin, either on its own or in combination with other medicines, was the most often given antidiarrheal by general practitioners and paediatricians. 92% percent of GPs dispensed prescription compositions of unknown structure, generally known as 'mixtures', produced in their personal drug dispensing corner in 78.5% of encounters, on top of prescribing antidiarrheals and other drugs. General practitioners (35%) and paediatricians (21%) both

administered Injectables in 17% of patient interactions. Both general practitioners and paediatricians prescribed a wide range of medications, such as cough syrups, antihistamines, and pain relievers. When we analysed the number of visits to both primary care physicians and paediatricians when antibiotics were prescribed, we discovered that only 27 visits to a GP and 17 visits to a paediatricians included a report of blood in the patient's stool. Another 29 GP visits and 17 paediatricians visits when blood was recorded did not result in the administration of antibiotics. Therefore, doctors did not prescribe antibiotics more often when patients reported having blood in their stools. Patients spent an average of 4 +/- 2 minutes in general practitioners' offices, while they spent 8 +/- 2 minutes in paediatricians' offices. Antibacterial prescribing was shown to be considerably lower with longer contact time amongst GPs compared to among paediatricians when comparing the two groups. In 51% of these visits, doctors prescribed antibiotics in less than 2 minutes, whereas in 32% it took between 2 and 4 minutes. Paediatricians, however, showed a reverse trend. When paediatricians prescribed antibiotics, the average length of the interaction was 15 minutes, with 28% of visits lasting between 6 and 9 minutes.

Table 3: Drugs prescribed by GPs & paediatricians

	GPs		Paediatricians	
	Encounters	%	Encounters	%
Antidiarrhoeals	312	49	118	32.5
Antiamoebics	165	27.2	88	22.3
Antibacterials	255	41.7	143	37.1

Discussion

Most studies on doctors' work habits have focused on the frequency of patient contacts rather than the total number of doctors [4-6]. Therefore, we used the total amount of encounters to ensure comparability with the vast majority of research around the globe. Only one study comparing general practitioners' and paediatricians prescribing habits for treating children's diarrhoea was located.

ORS

The World Health Organisation recommends using oral rehydration salts (ORS) rather than antidiarrheals or antibacterials as the primary treatment for children with diarrhoea. Antibiotics may be prescribed for those with bloody diarrhoea. The presence or absence of dehydration could not be documented by observers since doctors did not warn patients' parents about the risk. Therefore, determining the correct dosage of ORS is quite challenging. 65% of cases involved watery diarrhoea, and the average number of bowel movements per day was less than five in fewer than 51% of cases. Since we found no statistically significant difference in the proportion of GPs and paediatricians who provided ORS appropriately, we estimated that ORS would be necessary in at least 54% of all contacts. Overall, our study's ORS prescription rate (including all encounters) is higher than those recorded from Mexico [3], Peru [4], and Bangladesh [5], but it is preferable that it is lower than that published from Zaire [16]. It's not easy to pin down exactly what led to this disparity, but it's possible that widespread media endorsement of ORS use in some nations played a role. It was reassuring to see that 21% of GPs and 16% of paediatricians provided ORS in 100% of their encounters, even though the proportion of GPs not prescribing ORS at

all was substantially larger than the number of paediatricians. Parents should be taught how to make and use ORS, not just prescribed it. The objective of secure and efficient rehydration cannot be realised without in-depth understanding of the planning and appropriate use of ORS. While paediatricians were more likely to instruct patients on how to prepare ORS and how much to use, the total percentage was still unacceptably low. The low rate at which parents are explained how to prepare and use ORS cannot be attributed solely to a shorter average contact time with GPs than with paediatricians. When doctors recommend ORS, they have a responsibility to detail the proper preparation and administration.

Antidiarrhoeals

Antidiarrheals are not necessary for any form of diarrhoea; yet, in this study, considerably fewer paediatricians than general practitioners recommended antibiotics. The anti-diarrheal kaolin was prescribed by doctors with the 'mixtures' they already gave out. Kaolin is a common ingredient in these unnamed concoctions, along with bismuth carbonate and possibly additional medications like antibiotics. More general practitioners (GPs) than paediatricians (Paediatricians) prescribe antidiarrheals, but this may be due to a lack of expertise on the part of the GPs. General practitioners are more likely to give in to pharmaceutical company pressure to prescribe antidiarrheals and other medications because they have limited access to CME programmes that are not supported by the industry^[17]. Therefore, efforts must be made to improve consumer understanding and provide better health information in order to reduce parental demand for medications, in along with upgrading the knowledge of GPs.

Antiamoebics

We hypothesise that antiamoebics were prescribed to reduce the duration and incidence of diarrhoea instead of to treat amoebiasis or giardiasis because their use was not correlated with the observed presence of blood in the stool. Why family doctors and paediatricians would recommend antiamoebics is puzzling.

Antibacterials

Our findings show that antimicrobial prescriptions are less common here than in Peru^[4], Indonesia^[6], or India^[18], but more common here than in Bangladesh^[5] or Zaire^[16]. It was previously stated that in India^[18] general practitioners were more likely to prescribe chloramphenicol than cotrimoxazole, but we discovered that this was not the case. The similarities between the general practise patterns in India and the United Arab Emirates are intriguing. During casual conversations with certain general practitioners and paediatricians, the lack of laboratory space or an unwillingness of patients to shell out money for microbiological tests were cited as grounds for administering antibacterials and antiamoebics. Therefore, while treating children with diarrhoea, he typically prescribed a combination of metronidazole and an antibiotic. Similarly, one of the city's busiest paediatricians shared with the author (SQN) that it is challenging to evaluate the reason of diarrhoea on a clinical level because patients are unable to pay for laboratory tests. In most cases of diarrhoea, the only course of treatment is the use of antibiotics. Since microbiology isn't always necessary, this justification for

prescribing antibacterials doesn't hold water. If dysentery is suspected, a simple stool microscopy may be sufficient. However, our research shows that there isn't nearly enough time during doctor visits for patients and doctors to discuss ordering and analysing diagnostic tests. In addition, there is never enough time during these encounters to collect a meaningful history about the frequency, duration, and type of diarrhoea. A thorough medical history can help determine if an antibacterial drug is required. Our research supported this by showing that in a sizable proportion of interactions (one third to half), insufficient information was gathered regarding the incidence, duration, and type of diarrhoea. Peruvian researchers Aguila, *et al.*^[4] reported a lack of adequate backgrounds as well as data about stool characteristics. Short consultation times are only one possible explanation for the lack of evidence-based drug use^[19]. In order to speed up the healing process after being sick, patients frequently see multiple doctors at once. This means that the goal of both the patient and the doctor is a speedy recovery. As the doctor wants to keep his patients as long as possible, they may prescribe multiple medications at once in the hopes that one will work. The financial incentive to prescribe "mixtures" and Injectables is suspect. In order to be compensated fairly, physicians must dispense at least some medications from their office. This may be one of the explanations why so many general practitioners (87%) prescribe drugs (mixtures) whose constituent parts are unknown to the patient. If these doctors prescribe Injectables to their patients, they will earn more money. Akhtar^[13] and others have highlighted that general practitioners in India frequently prescribe Injectables, and reports from India^[18] describe a similar rate of medicine dispensation (mixtures). General practitioners can benefit monetarily from the use of mixtures and injections. It may be argued that the doctors were within their rights to prescribe antibacterials because they could have been used to treat symptoms other than diarrhoea, like fever and cough. During our observations, we looked for reasons to prescribe antibacterials so that we could evaluate this statement. We were unable to succeed in this endeavour since neither the diagnosis nor the prescriber's intent were known in the vast majority of encounters. During individual sessions, we lacked sufficient data to determine whether or not the therapy was effective. As a result, we relied on INRUD-recommended medication usage indicators^[20], such as prescribing rates of antibacterials during patient contacts. There is evidence that the amount of time a doctor spends with a patient influences the medications they prescribe^[21]. Our research revealed that general practitioners (GPs) prescribed antibiotics at a lower rate per encounter than paediatricians did. It is unclear why paediatricians prescribe antibacterials more frequently and for longer durations of time during patient interactions. We can only assume that paediatricians gave careful thought before prescribing antibiotics.

Conclusion and Recommendations

We discovered not only inefficient ORS prescribing, but also insufficient parental education on preparation and dosing. Rehydration, avoidance of dehydration, and decrease of mortality cannot be achieved unless ORS is properly prepared and used. The awareness and adoption of ORS should place a premium on instructing parents in the proper preparation and administration of ORS. The health

literacy of consumers and steps to increase practitioners' awareness are both important to lowering the over prescribing of antibacterials and antidiarrheals. This is significant because it can lessen the pressure from parents to find a quick fix with medication.

Conflict of Interest

Not available

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