Acute Diarrheal Management in Adults: A Simulated Client Study at Community Pharmacies of Quetta City, Pakistan

Asad Khan[1], Qaiser Iqbal[1], Sajjad Haider[1], Adnan Khalid[2], Mohamed Azmi Hassali[3], Fahad Saleem[1,*]
[1]Faculty of Pharmacy and Health Sciences, University of Balochistan, Quetta, Balochistan, PAKISTAN.
[2]Department of Surgery, Combined Military Hospital, Quetta, Balochistan, PAKISTAN.
[3]School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, MALAYSIA.

Abstract

Objective: By using a simulated client approach, we aimed to assess the management of acute diarrhea in adults at community pharmacies in Quetta City, Pakistan. **Methods:** This was a cross sectional, simulated client study. The study was carried out in Quetta, the provincial capital of Balochistan province, Pakistan. Community pharmacies located in the urban region with more than 100 clients per day were targeted for data collection. The simulated client presented himself at the community pharmacies seeking treatment for acute diarrhea with a pre-planned discussion protocol. SPSS v 21.0 was use for data analysis. Based on the objectives of the study, data was described descriptively as frequencies and percentages. **Results:** A total of 185 pharmacies qualified for the study as per inclusion criteria but data was available from 155 CPs (83.7%). The average working hours for the CPs were fourteen while qualified pharmacist was only present in fifteen (9.6%) of the pharmacies. The consultation time at the pharmacies ranged from 1-4 mins with a mean of 2.37±0.535 mins. Tablet metronidazole was the most frequent medicine dispensed (78.1%) at the CPs. Dimenhydrinate was dispensed (41.3%) followed by Oral Rehydration Solution (ORS) and tablet domperidone (35.5 and 25.8%) respectively. Minimum cost of medicine dispensed ranged from 10 Pakistan Rupees (PKR) i.e. (0.086 USD) to 960 PKR i.e. (8.30 USD). **Conclusion:** The management of acute diarrhea failed to meet the standard anti-diarrheal treatment as proposed by the guidelines. Therefore, a substantial improvement of pharmacy practice at the community pharmacies is urgently needed.

Key words: Acute Diarrheal Management, Community Pharmacies, Quetta, Simulated Client Study.

INTRODUCTION

Acute diarrhea in adults is defined as an increased stool content or frequency that lasts for less than 14 days.[1] Additionally, an abrupt onset of 3 or more loose or liquid stools above baseline in a 24 h period is also termed as acute diarrhea in adults.[2] In clinical practice, although acute diarrhea is often related to viral gastroenteritis; increased travelling, co-morbidities and food borne infections are closely linked to bacteria-related acute diarrhea.[3] Even though acute diarrhea is a commonly reported condition, The Global Burden of Disease Study reported 2.3 billion illnesses and 1.3 million deaths worldwide resulted from acute diarrhea in 2015.[4] The study also highlighted acute diarrhea as the leading cause of death among all ages as well as a leading cause of Disability-Adjusted Life Year (DALY) because of its impact on adolescent and children.[4] Although, the past few decades have seen multiple interventions in terms of diarrheal treatment and management,[5] diarrheal mortality rates are still higher around the globe and have remained comparatively invariable during the past 2 decades.[6] In the nutshell, diarrhea still remains as an avertable burden of disease, predominantly in the South Asian and sub-Saharan African regions.[4]

The treatment and management of acute diarrhea in the initial stages is relatively simple.[5] For the very reason, it is a general observation that acute diarrhea is perceived as a normal condition. As the conditions worsen, patients initially prefer to consult a community pharmacy as it is the first point of contact for the management of common illnesses.[7] The community pharmacy carries a strong attraction for the patients as they can get symptom-based care and advice without any professional charges. In addition, community pharmacy is easier to contact and most importantly require less time of consultation.[7,8] Therefore, community pharmacies are valued for their prospective role in the management of common ailments including acute diarrhea around the globe.[9,10] However, it is to be noticed that management and treatment of such ailments involve apposite understanding of patient profile as well as guidelines to treatment. Consequently, the individual stationed at the community pharmacy requires adequate knowledge and skills for effective disease management that is rarely reported from developing countries.[11,12]

Inline to what is reported, community pharmacies are also the first port of call in any disease condition or ailment in Pakistan. However, opposite to what is reported from developed countries, community pharmacies in Pakistan are still involved in traditional dispensing of medicines.[13] Community pharmacies follow a conventional business model and patient oriented activities are least reported in literature.[14] In a nutshell, provision of community pharmacy services is not up to the standard in Pakistan. Additionally, community pharmacies in Pakistan are generally owned by non-pharmacist (businessmen) and there is a lack of qualified pharmacist practicing at community pharmacies. Therefore, it is hypothesized that majority of the individuals dispensing at the community pharmacies are unaware of treatment guidelines and quality use of medications for common ailments presented at their counters. This in return shapes into irrational practices hence leading to treatment complications, drug resistance and additional economic burden on the society. Therefore, to evaluate the practices of minor ailment management at community pharmacies in Pakistan, we planned a study by using a simulated

Client Approach (SCA). The approach utilizes surveyors who act as patients to make furtive observations of health worker practices during consultations.[15] The SCA is an excellent approach to assess the quality of health care delivery and identify areas for quality improvement.[16] The method is also highly consistent both in terms of reliability and validity as it allows insight into actual transactions and experiences of customers in a real time environment. Furthermore, SCA is a adaptable tool that has been widely used in both low-income and high-income settings to assess the actual practices of community pharmacies.[17] Hence considering that acute diarrhea is a common aliment in a developing country like Pakistan, it is vital to understand how patients are managed at community pharmacies where such treatment is frequently sought. We therefore aimed to assess the management of acute diarrhea in adults at community pharmacies in Quetta city, Pakistan.

MATERIALS AND METHODS
Methods
Study design and settings

This was a cross sectional, simulated client study. The study was carried out in Quetta, the provincial capital and largest city of Balochistan province, Pakistan. Located in northern Balochistan near the Pakistan-Afghanistan border, Quetta is a trade and communication centre between the two countries. The city is near the Bolan Pass route which was once one of the major gateways from Central Asia to South Asia. Quetta has a population of nearly 2.3 million out of which 1.3 million has urban residency and the district has relatively better health indicators than the rest of the province.[18]

Inclusion criteria

Unfortunately, there is unavailability of the exact number of community pharmacies operating in Quetta city. However, as per information provided by the official portal of Government of Balochistan, more than 1000 community pharmacies are registered in Quetta district.[19] For the current study, we targeted the community pharmacies located in the urban region with more than 100 clients per day. Those community pharmacies not fulfilling the inclusion criteria were excluded from data collection.

Data collection and time frame

Data was collected from May 2018 to October 2018. The first author was trained by the research team to present himself at the community pharmacies seeking treatment for acute diarrhea and hence presented himself as a Simulated Client (SC) as presented in Table 1. Because of the financial limitations, the SC was unable to purchase the medications that were dispensed during the consultation. However, the SC made it sure that he memorizes the medications and quantity that were dispensed for acute diarrhea. The SC later excused by mentioning lack of money and informed to return back with the required amount to purchase the medicine. Soon after the SC left the premises, he filled out a questionnaire and noted information regarding questions asked at the pharmacy, medicines dispensed and advice offered. Each pharmacy was visited once, unless it was closed and then a second visit was made before it was excluded.

Ethical approval

Faculty of Pharmacy and Health Sciences, University of Balochistan, Quetta approved the study. Because of the nature of the study, informed consent was not obtained as it would have revealed the objective of the study hence compromising the study design and its results.

Table 1: Instructions to the SC for presenting the complaints at the CPs.

Chief complaint: Loose stools for three days	
The SC approaches the community pharmacies ask for treatment. When asked with questions, the following were responses at every pharmacy:	
Questions and answers	
Since how long you have loose stools?	3 days
How many stools are passed a day?	4-6 times
Any blood in stool?	No
Abdominal cramps and pain	Mild to moderate
What did you eat?	Home cooked food
Loss of appetite/nausea or vomiting?	Mild
Have you used any medication?	No
Have you seen a physician?	No
Do you have a prescription?	No

Data analysis

SPSS v 21.0 was use for data analysis. Based on the objectives of the study, data was described descriptively as frequencies and percentages.

RESULTS

A total of 185 pharmacies qualified for the study as per inclusion criteria but data was available from 155 CPs (83.7%) as the thirty pharmacies were closed despite the repeat visit. The average working hours for the CPs were fourteen while qualified pharmacist was only present in fifteen (9.6%) of the pharmacies. The consultation time at the pharmacies ranged from 1-4 min with a mean of 2.37±0.535 mins. No counseling was offered at the community pharmacies to the SC.

Medicines dispensed during the SC visit

The type of medicines that were offered during the SC visit is presented in Table 2. Tablet metronidazole was the most frequent medicine dispensed (78.1%) at the CPs. Dimenhydrinate was dispensed (41.3%) followed by Oral Rehydration Solution (ORS) and tablet domperidone (35.5 and 25.8%) respectively. Ciprofloxacin was also dispensed in 20.6% while attapulgite was dispensed in 14.2 % of the cases.

Frequency of medications dispensed during the SC study

Table 3 presents the frequency of medication dispensed during the SC visit. Metronidazole was dispensed to a minimum of 4 to maximum of 12 tablets. Tablet domperidone was dispensed with a minimum of 4 tablets to maximum of 10 with a range of 6 tablets. Oral Rehydration Salts were dispensed to a minimum of one sachet to maximum of 10 with a range of 9 sachets. Ciprofloxacin was ranged from minimum of 6 tablets to a maximum of 10 tablets while metronidazole + diloxanide ranged from a minimum of 6 to maximum of 16 tablets. Furthermore, minimum cost of medicine dispensed ranged from 10 Pakistan Rupees (PKR) i.e. (0.086 USD) to 960 PKR i.e. (8.30 USD).

DISCUSSION

Community pharmacies play a vital role in the provision of optimum healthcare services. This has become more imperative as the traditional role of dispensing of medication is heavily replaced by a patient-oriented

Table 2: Medications dispensed during the simulated client study.

Medications	Frequency	Percentage
Metronidazole (tablet 400mg) Yes No	121 34	78.1 21.9
Domperidone (tablet 10 mg) Yes No	40 115	25.8 74.2
Oral Rehydration Solution (sachet) Yes No	55 100	35.5 64.5
Ciprofloxacin (tablet 500 mg) Yes No	32 123	20.6 79.4
Attapulgite (tablet) Yes No	22 133	14.2 85.8
Dimenhydrinate (tablet) Yes No	64 91	41.3 58.7
Metronidazole+Diloxanide (tablet 400/500 mg) Yes No	27 128	17.4 82.6
Ofloxacin (tablet 200 mg) Yes No	6 149	3.9 96.1
Loperamide (tablet) Yes No	26 129	16.8 83.2
Multiviatamins (tablet) Yes No	16 139	10.3 89.7
Mebeverine (tablet) Yes No	20 135	12.9 87.1
Probiotics (tablet) Yes No	17 138	11.0 89.0

Table 3: Frequency of medications dispensed during the simulated client study.

Amount of medications	Frequency	Percentage	Maximum	Minimum	Range
Metronidazole (tablet 400mg) 3 4 6 8 10 12	69 2 45 2	1.9 44.5 1.3 29.0 1.3	12	4	8
Domperidone (tablet 10 mg) 4 6 10	6 27 8	3.9 17.4 5.2	10	4	6
Oral Rehydration Solution (sachet) 1 2 3 4 5 6 10	1 9 16 4 8 16 1	0.6 5.8 10.3 2.6 5.2 10.3 0.6	10	1	9
Ciprofloxacin (tablet 500 mg) 6 10	12 20	7.7 12.9	10	6	4
Attapulgite (tablet) 6 10	16 6	10.3 3.9	10	6	4
Dimenhydrinate (tablet) 2 4 5 6 10	1 1 1 46 5	0.6 0.6 0.6 29.7 9.7	10	2	8
Metronidazole+Diloxanide (tablet 400/500 mg) 2 4 6 10 16	2 12 12 1	1.3 7.7 7.7 0.6	16	4	12
Ofloxacin (tablet 200 mg) 6 10	3 3	1.9 1.9	10	6	4
Loperamide (tablet) 2 4 6 10	1 5 16 4	0.6 3.2 10.3 2.6	10	2	8
Multiviatamins (tablet) 30	16	10.3	30	30	0
Mebeverine (tablet) 4 6 10	1 13 6	0.6 8.4 3.9	10	4	6
Probiotics (tablet) 4 5 6 8 10	3 1 10 2 1	1.9 0.6 6.5 1.3 0.6	10	4	6

approach. Among the numerous responsibilities of community pharmacy, the far most important role is the provision and promotion of quality use of medicines. This ensures responsible medication use hence decreasing the overall cost of treatment both in terms of societal and economic measures.[20,21] At the same time, medication adherence advice, risk evaluation and mitigation strategies enables the community pharmacists to act as an advisors to physicians and contribute directly in the decision making process.[22] Our claim is evident in literature whereby the importance of community pharmacy was reported in emergency contraception, self-initiated aspirin treatment, referral for medical advice and smoking cessation therapies.[23] Additionally, the access of reaching a community pharmacy is seriously preferred by public.[24] An estimated 438 million health-related visits to a community pharmacy were reported compared to 340 million general physician consultations.[25] Therefore, community pharmacies present an environment of confidence that advances wellbeing of the public by reducing costs and improvement in the overall quality of life.[26]

Keeping the emerging role of community pharmacies in mind, the current study was aimed to assess the management of acute diarrhea at community pharmacies of Quetta city, Pakistan. As per standard treatment guidelines of acute diarrheal management proposed by World Gastroenterology Organization,[6] Oral Rehydration Therapy (ORT) is the treatment of choice. Parallel to the ORT, loperamide (4-6mg/d) is the agent of choice for adults. However, loperamide should be discouraged in suspected inflammation which

can be sort out by significant abdominal pain or bloody diarrhea cases. The use of adsorbents such as kaolin, activated charcoal and attapulgite add to the cost of therapy, has minimal efficacy and hence should not be used in acute diarrhea. Ciprofloxacin is drug of choice in diarrheal cases of cholera, campylobacter and shigellosis, while metronidazole is indicated for the cases of giardiasis and invasive intestinal amebiasis. Probiotics have pronounced health benefits in human beings, however; verification is needed for the efficacy of each strain hence use in acute diarrhea depends upon proper laboratory investigation. Therefore, the use of probiotics in developing countries is not promoted due to lesser facilities in terms of diagnosis.[6]

In the current study, the most commonly dispensed drug was metronidazole (78.1%). Ironically, ORS was observed in only 35.5% and loperamide in 16% of the entire cases. Almost 25% of the prescriptions contained domiperidone while 41.3% of the prescriptions had dimenhydrinate. In this SC study, we concluded that irrational therapy to manage AD was a common trend at community pharmacies of Quetta city because ORS and loperamide being first line therapeutic agents were not dispensed. Additionally, metronidazole and attapulgite with minimum efficacy and adding to the cost of therapy was observed. Furthermore, agents such as dimendyrinate, probiotics, mebeverine, multivitamins and domeperidone were also dispensed despite of their negligible role in managing acute diarrhea. Lack of performing the diagnostic procedures in order to sort out the exact etiology of diarrhea was again a major cause of irrational therapy. In this study none of the cases were sent for a diagnostic procedure and all of dispensed medications were based on empirical therapies. There was no trend of history taking, counseling and non-pharmacological advices despite of their prime importance in managing acute diarrhea. Overall management of acute diarrhea was suboptimal in this study.

The possible causes of this suboptimal therapy trends are multifold. Lack of qualified pharmacists at the community pharmacies is the prime cause. There are estimated 45,000–50,000 wholesale and retail drug outlets in Pakistan. However, there are only 8102 registered pharmacists present in the entire country. Therefore, most of these pharmacies are managed by non-professionals who lack adequate knowledge and do not possess any professional qualification that leads to irrational dispensing.[27]

Additionally, time of interaction with the SC was another important issue highlighted by the current study. Insufficient interaction time is a major hurdle in implementation of pharmaceutical care to patients attending community pharmacies.[28] The trend of following conventional or classic therapies without updating oneself or taking a novel initiative in treating acute diarrhea is again a major cause of suboptimal therapy. Finally, profitability was reported as an influencing factor as operators of the community pharmacies preferred to dispense medications with high profitability such as probiotics and avoiding ORS and loperamide thus promoting irrational prescribing. The economic profile of this study was again questionable as the minimum cost of dispensing was Pakistan Rupees 10 (0.086 USD) while maximum was Pakistan Rupees 960 PKR (8.30 USD) with mean of Pakistan Rupees 176.87 (1.28 USD) indicating a huge variance in selection of medicines at the community pharmacies in Quetta city.

CONCLUSION

It was observed that management of acute diarrhea failed to meet the standard anti diarrheal management as proposed by the guidelines. Therefore, a substantial improvement of pharmacy practice at the community pharmacies is urgently needed. As majority of the community pharmacies are operated by non-professionals, the results can be generalized to the rest of the province as Quetta in the most advanced city of Balochistan. It is high time that policy makers should make sure about the availability of a qualified pharmacist at the community pharmacies. Furthermore, well designed professional education programs must be arranged to ensure continuous professional development of the pharmacists practicing at the community pharmacies.

Study Limitations

Because of financial limitations, we were unable to purchase medicines that were dispensed during the SC visit. Therefore, a recall bias is possible, however; the SC was trained appropriately to remember and memorize the medicines dispensed during his visit to the CPs. Nevertheless, a more thorough study with the purchase of actual medicine is recommended.

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CONFLICT OF INTEREST
The authors declare no Conflict of Interest.

ABBREVIATIONS
DALY: Disability Adjusted Life Year; **SCA:** Simulated Client Approach; **SC:** Simulated Client; **PKR:** Pakistan Rupees; **ORT:** Oral Rehydration Therapy.

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