

Management of acute diarrhea in adults in hospitals in Beijing did not adhere well to Manatsathit working party guidelines

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Abstract: How hospital physicians adhere to guidelines on management of diarrhea in adults has not been adequately assessed. The purposes of this study were to evaluate the management of acute diarrhea in adults and to assess the adherence of hospital physicians to the Manatsathit working party recommended guidelines. A cross sectional survey was carried out during May to July 2011 among physicians in 10 hospitals in Beijing, China. Data were collected for 400 patients (208 females and 192 males) with the mean age of (35.5±14.8) years. Overall, 357 (89.3%) patients presented with watery diarrhea and 43 (10.7%) patients presented with bloody diarrhea. Of 357 patients who needed fluid and electrolyte therapy, however, up to 114 (31.9%) patients were not ordered any fluid and electrolyte replacement; although only 28 (7.8%) actually supposed to use the antibiotics due to an age of higher than 65 years or being immunologically compromised, however, 186 (52.1%) were prescribed antibiotics which significantly deviated from the guidelines recommended by the Manatsathit working party. Antimotility drugs were only used in seven patients with watery diarrhea, which was in line with the guidelines. Hospital physicians in Beijing did not adhere well to the guidelines for the management of acute diarrhea. Physicians might need to be refreshed on the guidelines in this specific field.

Keywords: Acute diarrhea; Adults; Cross-sectional survey

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1. Introduction

Acute diarrhea in adults is one of the most common diseases around the world^[1-4]. Specifically, in south-east Asia, the incidence of diarrhea in adults was reported to be 0.3 episodes/person-years and the rate has remained unchanged during the last 30 years^[5]. More generally, in the industrialized countries, the incidence of acute diarrhea in adults has been estimated to be 0.5–2 episodes/person-years, but the corresponding figure could be much higher in the developing and underdeveloped countries^[6].

Regulatory medical authorities have provided guidelines for the management of adult diarrhea including the guidelines recommended by the Manatsathit working party, which were published specially for management of the adult patients with acute diarrhea. The guidelines have recommended that the majority of cases of acute diarrhea are watery diarrhea (semiformed to loose or watery), administration of antibiotics are unnecessary. However, rehydration remains the mainstay of treatment in this group of patients and early hydration with oral rehydration therapy (ORT) should be encouraged, while intravenous fluid replacement

is often not needed unless the patients with moderate to severe dehydration or severe vomiting. For patients with bloody diarrhea, antibiotics are recommended after having excluded enteritis by enterohaemorrhagic *E. coli*. Actually how well these guidelines are adhered to on clinical practice by physicians in hospitals in China has not been adequately assessed. Most studies of acute diarrhea have been focused on children^[7-9], whereas a few studies on adults have mainly addressed individual aspects of the management of acute diarrhea, such as antibiotic use^[10,11]. The present cross-sectional study was conducted to evaluate comprehensively the management of acute diarrhea in adults and to assess adherence to guidelines in hospitals in Beijing, China.

2. Patients and methods

2.1. Study city, hospitals, patients and physicians

A cross-sectional survey was carried out in adult patients with acute diarrhea in Beijing, China, between May 16 and July 21, 2011. It involved five districts in Beijing city, including Xicheng, Dongcheng, Haidian, Chaoyang and Fengtai and 10 hospitals, which covered more than most of the population of Beijing. District choice was abided by the decentralized principle and hospitals were chosen mainly

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according to the inclusion criteria, which included: a) public hospitals; and b) general hospitals with specialist clinics for diarrhea. The clinics in the rural area were not included in the survey, because the primary focus of the survey was on the physicians with specialization in diarrhea and on how well they managed their acute diarrhea patients. The rural area clinics had small number of patients and their doctors were not the specialists in diarrhea. This could be due to the reason that most patients with acute diarrhea in rural area would typically go to a pharmacy first to get medications instead of going to clinics. The inclusion criteria for the patients included: a) acute infectious diarrhea; b) age above 18 years old; and c) volunteering to take the survey. The inclusion criteria for the physicians included: a) being a specialist physician in treating diarrhea; and b) volunteering to take part in the survey.

2.2. Definition of the terms included in the survey

Acute diarrhea was diagnosed if the patient was passing at least three loose or watery stools in 24 h or at least one bloody stool with an illness duration of no longer than 14 d. Watery diarrhea was defined as a stool with deviations from a normal-looking stool, semiformed to loose or watery without the presence of blood. Bloody diarrhea was diagnosed via a macroscopic observation when the stool contained blood was mixed with feces or was inseparable from the stool.

2.3. The guidelines used for the criteria

The guidelines recommended for management of diarrhea by World Health Organization (WHO) are mainly for children^[12]; whereas the guidelines recommended by the Manatsathit working party were specifically aimed at adults^[6]. Therefore, in this survey, we chose the latter as the criteria for the management of acute diarrhea in adults. The Manatsathit working party consisted of nine experts in gastroenterology and immunology from Thailand, US, UK, India and the Netherlands. These guidelines were set based on the review and analysis of the internationally published literature on acute diarrhea and consensus conferences among the experts. It has been implemented since 2002.

2.4. Data collection

An anonymous, paper-based, descriptive questionnaire was used to collect the data. The questionnaire required physicians to report the characteristics of the patients with acute diarrhea they evaluated. Furthermore, they were required to collect the results of any tests and medications that were ordered for the patients.

The questionnaire was comprised of the questions regarding to: their demographic characteristics, the onset

and duration of diarrhea, frequency of stool passage per day, stool characteristics, presence of vomiting, fever and abdominal pain, self-medication, underlying diseases, physical examination of patients, stool examination and culture, and management of diarrhea.

2.5. Ethics

The Ethics Committee in Human Research at Peking University First Hospital, Beijing, China approved the study (EC approval letter number: 2011[322]). Informed consents were obtained from all the patients whose medical data were included in the study.

2.6. Data analysis

Data were analyzed using SPSS software (SPSS/Pct, version 13.0; IBM Corp, Armonk, New York, NY, USA). The differences in categorical variables were assessed with the χ^2 test. The incontinuous variables were assessed with the *t*-test. Continuous variables were expressed as means \pm standard deviation (SD) with 95% confidence intervals (CIs). The differences were considered statistically significant at a *P* < 0.05.

3. Results

3.1. Questionnaire completion

During the time course of the 9-week study, 10 hospitals participated in the survey. These hospitals were all public, general and tier 3 hospitals with (1151 \pm 381) beds. Of those, seven were teaching hospitals and six were non teaching hospitals (no community hospitals). In total, 400 questionnaires were completed (40 questionnaires per hospital were set as sampling criterion). Patients included in the study were all out-patients and no hospitalized. The total number of diarrhea patients per hospital was (2719 \pm 1460) and the enrollment rate per hospital was (2.2 \pm 2.2)%. In these 10 hospitals, 32 physicians participated in treating 400 episodes of diarrhea, accounting for 65.3% (32/49) of all the physicians in the specialist clinics. Of those, 12 physicians (37.5%) were residents, 15 physicians (46.9%) were attending physicians, 3 physicians (9.4%) were associated chief physicians and 2 physicians (6.3%) were chief physicians.

3.2. Patient demographic characteristics

All the 400 participating patients were the Chinese local residents in Beijing. Among the total patients 52.3% (209/400) were females with the mean age of (35.5 \pm 14.8) years. Most of the patients (300/400, 75.2%) were within the age range of 18–44 years; 19.3% of total patients

(77/400) were 45–64 years old and 5.5% of total patients (22/400) were 65 years old or older.

3.3. Clinical characteristics of diarrhea

Clinical characteristics of patients with watery diarrhea and bloody diarrhea were shown in Table 1. Overall, the average time between the onset of the diarrhea and visiting a diarrhea clinic was (2.0±1.4) d. For 311/400 (77.8%) of the total patients, this time was less than three days.

3.4. Self-medication before visiting a diarrhea clinic

Overall, 145 (36.3%) patients performed self-medication before they visited a diarrhea clinic. A total of 46.9% (68/145) of patients took herbal medicines which were the most common drugs in self-medication followed by antibiotics 56/145 (38.6%). Self-medication details were shown in Figure 1.

3.5. Laboratory tests ordered by the treating physicians

Routine stool and blood examinations were ordered for 359/400 (89.8%) and 205/400 (51.3%) of the patients, respectively. More patients with bloody diarrhea were ordered for routine stool tests as compared to the watery diarrhea patients (Table 1). Overall, the stool culture was ordered for vibrio cholera and non-vibrio bacteria for 400/400 (100%) and 38/400 (9.5%) of the patients, respectively. However, 43/43 (100%) of patients with bloody

diarrhea were ordered for stool cultures for vibrio cholera but only 3/43 (7.0%) were ordered stool culture for non-vibrio bacteria. None of the isolates were positive for vibrio cholera. A total of 31 out of 38 stool cultures had no outcome specified for non-vibrio bacteria. Among seven positive results, three were diagnosed as strains of fungus, two as strains of *Shigella* spp, one as strains of *Escherichia coli* and another one as a strain of *Salmonella*.

3.6. Interventions ordered by the treating physicians

The interventions ordered for the treatment of diarrhea were presented in Figure 2. The most commonly ordered intervention was the use of probiotics (in 315/400, 78.8% of the patients), followed by rehydration therapy (277/400, 69.3%) and dioctahedral smectite (362/400, 65.5%).

3.7. Rehydration therapy

Of 277 patients with rehydration therapy, 195 (70.4%) patients were ordered oral rehydration solution (ORS) and 82 (29.6%) patients were ordered intravenous fluid replacement. Rehydration therapy in relation with the clinical features was presented in Table 1. Of 357 patients with watery diarrhea, 243 (68.1%) patients were ordered rehydration therapy, while other 114 (31.9%) of patients did not receive the therapy. On the contrary, among 43 patients with bloody diarrhea, for whom rehydration therapy is not generally necessary, 34 (79.1%) were ordered rehydration.

Table 1. Clinical characteristics of diarrhea, laboratory tests and management ordered by physicians for patients with watery diarrhea and bloody diarrhea

Items/symptoms	Watery diarrhea (n = 357)	Bloody diarrhea (n = 43)	P
Complaints, n (%)			
Fever	140 (39.2)	22 (51.2)	0.132
Abdominal pain	246 (68.9)	35 (81.4)	0.091
Vomiting	91 (25.4)	12 (27.9)	0.732
Moderate-to-severe dehydration	71 (19.9)	1 (2.3)	0.005
Frequency of stools/24 h, mean±SD [95% CI]	6.3±3.1 [6.0; 6.6]	7.5±3.9 [6.3; 8.7]	0.020
Time from onset of diarrhea to visiting diarrhea clinic, mean±SD [95% CI] (d)	2.0±1.4 [1.9; 2.2]	2.3±1.2 [1.9; 2.7]	0.185
Laboratory examination			
Routine stool examination	316 (88.5)	43 (100)	0.038
Stool culture for vibrio cholera	357 (100)	43 (100)	NS
Stool culture for non-vibrio bacteria	35 (9.8)	3 (7.0)	0.747
Routine blood examination	184 (51.5)	21 (48.8)	0.738
Treatment, n (%)			
Rehydration therapy	243 (68.1)	34 (79.1)	0.140
Oral rehydration solution (ORS)	173 (48.5)	22 (51.2)	0.738
Intravenous fluid replacement	70 (19.6)	12 (27.9)	0.203
Antibiotics	186 (52.1)	42 (98.7)	<0.0001
Dioctahedral smectite	242 (67.8)	20 (46.5)	0.006
Herbal medicine	191 (53.5)	22 (51.2)	0.772
Probiotics	282 (78.9)	33 (76.7)	0.732
Antimotility drugs	7 (2)	0 (0)	0.354
Polypharmacy (≥3 drugs/patients)	300 (84.0)	41 (95.3)	0.048

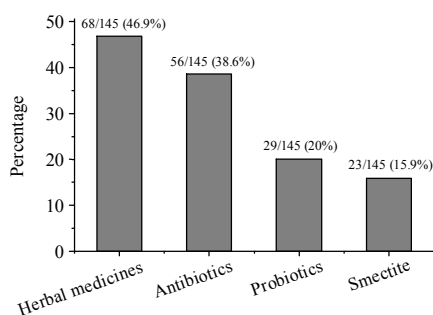


Figure 1. Self-medication of 145 patients with acute diarrhea before visiting diarrhea clinics.

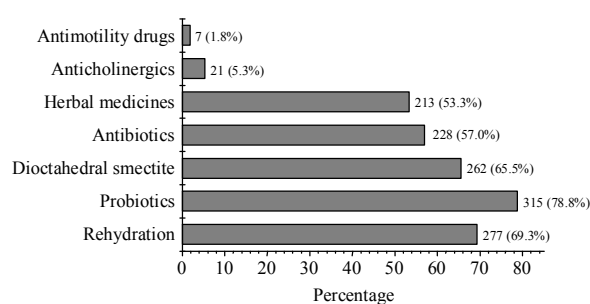


Figure 2. Treatment ordered by treating physicians for 400 patients with acute diarrhea.

3.8. Antibiotic therapy

Of 43 patients with bloody diarrhea, 42 (98.7%) patients were prescribed antibiotics and only one did not receive this therapy. Of 357 patients with watery diarrhea, 28 (7.8%) patients were older than 65 years old or were immunologically compromised having the indications for the use of antibiotics. However, 186 (52.1%) were prescribed antibiotic therapy even if the watery diarrhea didn't require the use of antibiotics.

Of 228 patients who were ordered antibiotics, 107 (46.9%) patients were prescribed fluoroquinolones, which were the most commonly used antibiotics in the antibiotic therapy, followed by aminoglycosides 70 (30.7%) and the third generation of cephalosporins 36 (15.8%).

3.9. Other therapy

Probiotics, diocetahedral smectite and herbal medicine were the commonly ordered drugs for either watery diarrhea or bloody diarrhea (Table 1). Antimotility drugs were seldom used, in total, only seven patients with watery diarrhea were ordered. Overall, the average number of drugs per patient was (3.5 ± 1) [95% CI: 3.4; 3.6]. A total of 341 (85.3%) patients received three or more drugs (polypharmacy).

4. Discussion

Although episodes of acute diarrhea are usually brief and self-limiting, treatment can relieve discomfort and symptoms. The present survey revealed that the mean interval between the onset of acute diarrhea and going to a specialist hospital diarrhea clinic was 2.0 d. This was similar to a 2.2 d reported from a study in primary care in Bahrain^[13].

According to the guidelines recommended by the Manatsathit working party, stool culture was not probably necessary for patients within their first few days after illness onset, presenting with mild diarrhea without obvious signs of dehydration. However, stool culture was advisable

for patients with bloody diarrhea, moderate-to-severe diarrhea with objective evidence of dehydration and for those with diarrhea that did not subside after a few days^[6]. In this survey, of total 400 cases, only 72 patients were with moderate-to-severe dehydration. However, stool culture for cholera was performed for all patients. This not only deviated from Manatsathit working party guidelines, but also did not conform to our National Cholera Monitoring Program. On the contrary, in this survey, we found that stool culture for non-vibrio bacteria was performed in a very small number of patients. Even in patients with bloody diarrhea, the rate of stool culture was only 3 (7.0%). Based on this information, physicians might need to be refreshed on the guidelines for patience in this specific field.

In general, it has been recognized that the principal reason to treat acute episodes of diarrhea is to relieve the patients' discomfort and social dysfunction^[14]. The Manatsathit working party advises that all adults with watery diarrhea, irrespective of whether they have clinical dehydration, should receive rehydration therapy. As the disease is a dynamic and progressive course and the mild dehydration might progress to a more severe one, early hydration could prevent fluid deficits^[6]. In this survey, a total of 357 patients presented watery diarrhea; however, up to 114 (31.9%) patients were not ordered any fluid and electrolyte replacement, which was a clear deviation from the guidelines. Physicians need to improve their awareness and knowledge regarding the appropriate treatment of diarrhea.

According to the guidelines of the Manatsathit working party, in patients with mild dehydration and little or no vomiting, oral rehydration therapy should be sufficient. Patients with severe dehydration, hypovolemic shock or dehydration with severe vomiting might need intravenous fluid replacement^[6]. This study indicated that among 277 patients who received rehydration therapy, 195 (70.4%) received oral rehydration solution (ORS) and 82 (29.6%) received intravenous fluids. This practice was in line with the guidelines recommended by the Manatsathit working party.

The logic behind the Manatsathit working party is that most acute diarrhea in adults presents as watery diarrhea. In general, symptomatic and supportive treatment is usually sufficient and antibiotics are necessary only for patients older than 65 or for those who are immunocompromised and those with predisposing conditions to septicemia^[6]. Nevertheless, this survey showed that among 357 patients with watery diarrhea, up to 186 (52.1%) were prescribed antibiotics although only 28 (7.8%) patients who were older than 65 or were immunologically compromised had indications for the use of antibiotics. This practice was a clear deviation from the guidelines recommended by the Manatsathit working party. The extreme misuse of antibiotics observed in the present survey was similar to that previously reported in Thailand^[10], which is also a very serious and longstanding problem in China^[15,16]. Misuse of antibiotics at the community level is also very common in China. In this survey, antibiotics were the common drugs in self-medication before visiting a diarrhea clinic. This could serve as an indication that a nationwide education in the rational use of antibiotics is essential.

The adsorbent dioctahedral smectite has been shown to increase the stool consistency and to reduce the duration of diarrhea in some clinical trials^[17]. However, based on the Manatsathit working party, adsorbents are not effective in patients with febrile and bloody diarrhea^[6]. In this survey, among 43 patients with bloody diarrhea, 20 (46.5%) were ordered dioctahedral smectite. This action was a clear deviation from the guidelines. There have been studies showing that the use of probiotics might reduce the clinical course of acute diarrhea in children^[18,19]. However, the number of randomized controlled clinical studies conducted has been too few to support the clinical use of the probiotics in adults. In the guidelines recommended by the Manatsathit working party, probiotic use in adults is mainly recommended in cases of chronic diarrhea and the relapse of antibiotic-associated enterocolitis^[6]. Our findings regarding the use of probiotics clearly deviated from the guidelines.

There are no much scientific data to support the efficacy of herbal medicines in treatment of acute diarrhea. Moreover, in the guidelines recommended by the Manatsathit working party, herbal medicine might be considered only for cases of mild watery diarrhea without dehydration but are not recommended for severe diarrhea irrespective of the causes^[6]. In this survey, a half of patients with bloody diarrhea were prescribed herbal medicines, which was also run counter to the guidelines. In this survey, antimotility drugs were used in only seven patients with watery diarrhea, which adhered well to the Manatsathit working party guidelines. Polypharmacy of prescriptions applied to 85.3% of all the diarrhea cases in this survey. As acute diarrhea is a very common condition affecting a large number of

people, the routine use of multiple drugs could create a great financial burden in the countries affected.

It should be pointed out that there were some limitations inherent in the study design. This study was a survey conducted only in one city in China. The results of the survey might only represent the situation of Beijing. In addition, this study was a survey of the self-reported practices of physicians in the management of acute diarrhea in adults. Their actual practices might not always be the same as those reported in the questionnaire. The guidelines recommended by Manatsathit working party for the treatment of acute diarrhea in adults might not always be appropriate due to the complexity of some diarrhea cases and conflicting data in some studies.

In conclusion, hospital physicians in Beijing, China, did not adhere well to the guidelines recommended by the Manatsathit working party for the management of acute diarrhea in adults. These findings suggested that re-education for physicians and implement of effective health policies are needed to improve the medical practice and to reduce the unnecessary burden on the healthcare system. In addition, this study has also indicated that a nationwide education in the rational use of antibiotics is essential.

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北京成人急性腹泻的诊治与指南存差距

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摘要: 临床医师诊治成人急性腹泻是否遵照指南不曾调查过。本研究目的旨在评估北京成人急性腹泻的诊治与腹泻诊治指南的一致性。2011年5月–6月在北京10家综合医院进行了腹泻诊治调查。400例患者接受调查, 平均年龄(35.5±14.8)岁, 52.3%为女性。所有患者中, 357例(89.3%)表现为水样腹泻, 43例(10.7%)表现为脓血便。在357例水样腹泻患者中, 114例(31.9%)患者没有给予补液治疗, 186例(52.1%)患者给予了抗生素治疗, 而有抗生素应用指证的患者仅有28例(7.8%, 年龄大于65岁或有免疫缺陷病)。这种处理完全背离了指南。止泻剂仅用于7例水泻患者, 与指南基本一致。北京综合医院对成人腹泻的诊治与指南存有差距, 需加强腹泻诊治培训。

关键词: 急性腹泻; 成人; 调查