



CODEN [USA]: IAJ PBB

ISSN : 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

<http://doi.org/10.5281/zenodo.4011521>
Available online at: <http://www.iajps.com>

Research Article

EFFICACY OF FIRST DOSE OF NITAZOXANIDE IN MANAGEMENT OF ROTAVIRUS DIARRHEA IN CHILDREN

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Article Received: July 2020 **Accepted:** August 2020 **Published:** September 2020

Abstract:

Rotavirus is a leading cause of morbidity and mortality in children younger than 5 years. This study was planned to record mean duration of rotavirus diarrhea in children after administration of first dose of nitazoxanide as this drug is cost effective but no local data is available evaluating mean duration of diarrhea after first dose of Nitazoxanide in children with rotavirus, while the previous studies were conducted on smaller sample size.

***Objective:** To determine the mean duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide.*

***Study Design:** Descriptive Case study.*

The calculated sample size is 175, with $d=1$, 95% confidence level taking expected mean duration of diarrhea after first dose of administration of Nitazoxanide i.e. $31.0+6.87$ hours

***Setting:** The study was conducted in Department of Pediatric Medicine, Children Hospital, Faisalabad.*

***Duration of study:** Six month from the date of approval of synopsis from board of study (July 2019 to Dec 2019)*

***Methodology:** All 175 patients fulfilling the inclusion/exclusion criteria were enrolled in the study. An informed consent to include their data with the assurance of confidentiality was obtained from their parents. All study cases were administered by the nursing staff as (200 mg nitazoxanide) twice a day for 3 days in patients 4–5 years of age, (100 mg nitazoxanide) twice a day in patients 12–47 months of age, and (7.5 mg/kg nitazoxanide) twice a day in patients younger than 12 months. In addition to the study education, all patients were receiving routine care including fluid replacement therapy and nutritional and metabolic management of diarrhoea. The nursing staff followed the children for every 12 hours till the normal formed stools. All this information was recorded on a pre-designed proforma. Duration of diarrhea was recorded as per operational definitions.*

***Results:** In our study, out of 175 cases, 58.86%($n=103$) were between 2-36 months of age while 41.14%($n=72$) were between 37-60 months of age, mean+sd was calculated as $35.06+13.34$ months, 44%($n=77$) were male and 56%($n=98$) were females, mean duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide was recorded as $32.85+2.32$ hours.*

***Conclusion:** We concluded that the mean duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide is not more than 1.5 days and it is suitable in our population for the management of rotavirus diarrhea.*

***Keywords:** Children, rotavirus diarrhea, Nitazoxanide, duration of diarrhea*

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Please cite this article in press Urwa Yaqoob et al, *Efficacy Of First Dose Of Nitazoxanide In Management Of Rotavirus Diarrhea In Children.*, Indo Am. J. P. Sci, 2020; 07(09).

INTRODUCTION:

Rotavirus is the leading cause of severe childhood gastroenteritis. Below one year of age, rotavirus represents the main etiologic agent, both in developed and developing countries. Globally, this agent is responsible for approximately 600000 deaths per year, 82% of which occur in less developed areas, leading cause of death being diarrhea which leads to dehydration and hypovolemic shock.[1]

Rotavirus diarrhea is more common during winter season in temperate climate. Peak age of Rotavirus diarrhea in children is 3 months to 2 years. Rotavirus infection is transmitted through feco-oral route. After incubation period of 48 hours, patient develops fever and vomiting followed by profuse watery diarrhea lasting for 5 to 7 days.[2]

Diarrheal episodes often compound the problem of co-existing malnutrition, risking sub-optimal growth and poor cognitive outcomes. Rehydration and correction of electrolyte imbalances are the mainstays of treatment, with an occasional role for targeted antimicrobial therapy.[3]

Nitazoxanide is a thiazolide antimicrobial developed in the 1980s with reported activity against a broad spectrum of pathogens and has also been shown to inhibit viral replication.[4]

Previously a study [5] recorded 35.6+28.9 hours for duration of diarrhea after administration of first dose of Nitazoxanide while another study [6] recorded this findings as 31.0+6.87 hours which shows a significant difference between the two studies.

The rationale of the study is that Nitazoxanide is cost effective but no local data is available evaluating mean duration of diarrhea after first dose of Nitazoxanide in children with rota virus, while the above studies were conducted on smaller sample size which needs a local study to be conducted in our population so that a local result based study may be helpful for managing rota virus diarrhea in children. If this proves to be beneficial, it will help reducing the mean duration of hospital stay.

MATERIAL AND METHODS:

This research was conducted in Department of Pediatric Medicine Children Hospital, Faisalabad, six months after approval from the hospital ethical review committee. Children having age from 2 months to 5 years consisting of both genders having diagnosed cases of rotavirus diarrhea (as per operational definition) diagnosed during last 24 hours were included in the study. Rotavirus Diarrhea was defined as the children with more than or equal to three loose stools or watery stools

in 24 hours lasting not more than 14 days with the symptoms including vomiting, fever (100.4°F), and abdominal pain. (Assessed on history and clinical examination) caused by Rota Virus diagnosed by ELISA technique. Mean duration was defined as the duration of diarrhea was calculated from the administration of first dose of Nitazoxanide till the normal formed stools less than 3 episodes per day (assessed on physical examination) and resolution of associated symptoms with diarrhea i.e fever, vomiting and abdominal pain. Patients were assessed after every 12 hours. Patients having history of diarrhea for more than 14 days and patients in whom dysentery (Assessed on physical examination considering more than or equal to three loose stools or watery stools in 24 hours lasting not more than 14 days with blood in stools) including patients already have received rotavirus vaccines, coexisting severe infection e.g. pneumonia (patchy infiltration on chest xray), sepsis (TLC >11000 or <4000/mm³), severe malnourished patients (weight for height < 3SD) and patients previously taken any antibiotic therapy by checking medical record in last 7 days before current illness were excluded from the study. All 175 patients fulfilling the inclusion/exclusion criteria admitted to Department of Pediatric Medicine Children Hospital, Faisalabad were included in the study were enrolled. An informed consent to include their data with the assurance of confidentiality was obtained from their parents. All study cases were administered by the nursing staff as (200 mg nitazoxanide) twice a day for 3 days in patients 4–5 years of age, (100 mg nitazoxanide) twice a day in patients 12–47 months of age, and (7.5 mg/kg nitazoxanide) twice a day in patients younger than 12 months. In addition to the study medication, all patients were receiving routine care including fluid replacement therapy and nutritional and metabolic management of diarrhoea. The nursing staff followed the children for every 12 hours till the normal formed stools. All this information was recorded on a pre-designed proforma (annexure). Duration of diarrhea was recorded as per operational definitions. The data was entered in computer software Statistical Package for Social Sciences (SPSS version 11.0). Categorical variables i.e. gender was described as frequency and percentages. Continuous variables i.e. age and duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide was recorded and presented as mean+sd. The data was stratified for age, gender, no. of stools per day of the children to control the effect modifier. Independent sample T test was applied. P value <0.05 was significant.

RESULTS:

A total of 175 cases fulfilling the

inclusion/exclusion criteria were enrolled to determine the mean duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide.

Age Distribution

Patients were distributed according to age of the patients, it shows that 58.86%(n=103) were between 2-36 months of age while 41.14%(n=72) were between 37-60 months of age, mean+sd was calculated as 35.06+13.34 months. (Table No. 1)

Table 1: Age Distribution (n=175)

Age(in months)	No. of patients	%
2-36	103	58.86
37-60	72	41.14
Total	175	100
Mean+SD	35.06+13.34	

Table 2: Gender Distribution (n= 175)

Gender	No. of patients	%
Female	98	56
Male	77	44
Total	175	100

Gender Distribution

Patients were distributed according to gender; it shows that 56%(n=98) were females and 44%(n=77) were male. (Table No. 2)

Mean Duration of Rotavirus

Mean duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide was recorded as 32.85+2.32 hours. (Table No. 3)

Table 3: Mean Duration Of Rotavirus Diarrhea In Children After Administration Of First Dose Of Nitazoxanide (n=175)

Duration of rotavirus (Hours)	Mean	SD
	32.85	2.32

Data Stratification

The data was stratified for age, gender, no. of stools per day of the children to control the effect modifier. Independent sample t test was applied. P value <0.05 was significant. (Table No. 4-6)

Table 4: Stratification For Mean Duration Of Rotavirus Diarrhea In Children After Administration Of First Dose Of Nitazoxanide With Regards To Age (n=175)

Age(in months)	Duration of rotavirus (Hours)	
	Mean	SD
2-36	32.73	2.34
37-60	33.01	2.30

P value=0.42

Table 5: Stratification For Mean Duration Of Rotavirus Diarrhea In Children After Administration Of First Dose Of Nitazoxanide With Regards To Gender (n=175)

Gender	Duration of rotavirus (Hours)	
	Mean	SD
Male	33.13	2.34
Female	32.62	2.30

P value=0.15

Table 6: Stratification For Mean Duration Of Rotavirus Diarrhea In Children After Administration Of First Dose Of Nitazoxanide With Regards To No. Of Stools (n=175)

No. of stools	Duration of rotavirus (Hours)	
	Mean	SD
3-8	32.88	2.36
>8	32.84	2.33

P value=0.43

DISCUSSION:

Rotavirus is a leading cause of morbidity and mortality in children younger than 5 years. This study was planned to record mean duration of rotavirus diarrhea in children after administration of first dose of nitazoxanide as this drug is cost effective but no local data is available evaluating mean duration of diarrhea after first dose of Nitazoxanide in children with rota virus, while the previous studies were conducted on smaller sample size.

In our study, out of 175 cases, 58.86%(n=103) were between 2-36 months of age while 41.14%(n=72) were between 37-60 months of age, mean+sd was calculated as 35.06+13.34 months, 44%(n=77) were male and 56%(n=98) were females, mean duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide was recorded as 32.85+2.32 hours.

We compared our results with a previous study [5] recorded 35.6+28.9 hours for duration of diarrhea after administration of first dose of Nitazoxanide while another study [6] recorded this finding as 31.0+6.87 hours which shows a significant difference between the two studies. However, our findings are in agreement with the successive study.

Carlos G. Teran and others [7] in a randomized, single-blind, controlled trial in order to assess the

effectiveness of nitazoxanide and probiotics in comparison with a control group and recorded that the median duration of hospitalization was significantly shorter ($p = 0.017$) in patients who received nitazoxanide (81 h) and probiotics (72 h) compared to patients who received oral rehydration solution alone (108 h). Similarly, the median duration of diarrhea was significantly reduced ($p = 0.009$) in children who received nitazoxanide (54 h) and probiotics (48 h) compared to the control group (79 h). They concluded that the treatment with nitazoxanide and probiotics is effective in the management of children with acute rotavirus diarrhea. Small differences in favor of nitazoxanide were found in comparison with probiotics. Nitazoxanide is an important treatment option for rotavirus diarrhea.

In Latin America, nitazoxanide has been widely available since the 1990s for use particularly in parasitic infections; it ranges in cost from US\$5 to US\$9 per solution in Bolivia. Probiotics are also available in different preparations with a cost range of US\$10 to US\$15 for a 5-day treatment. The difference in cost is important in developing countries like ours where the rate of incidence of severe rotavirus diarrhea is still high. If we consider the reduction in the duration of diarrhea and hospitalization, nitazoxanide becomes a good treatment option for rotavirus diarrhea, being safe, relatively cheap, and with good compliance to treatment from parents and children.

Nitazoxanide and probiotics become good alternatives in the management of hospitalized cases in areas where rotavirus vaccines are not yet available and for those who cannot be immunized or fail to build a proper immunity. Although preliminary results have demonstrated the effectiveness of nitazoxanide in comparison with probiotics and the control group, we recommend that similar trials be conducted with a larger number of patients in order to obtain more reliable results with statistical significance. This will enable criteria to be determined for its use.

CONCLUSION:

We concluded that the mean duration of rotavirus diarrhea in children after administration of first dose of Nitazoxanide is not more than 1.5 days and it is suitable in our population for the management of rotavirus diarrhea.

REFERENCES:

1. Grandy G, Medina M, Soria R, Terán CG, Araya M Probiotics in the treatment of acute rotavirus diarrhoea. A randomized, double-blind, controlled trial using two different probiotic preparations in Bolivian children. *BMC Infect Dis* 2010; 10:253.
2. Afzal A, Tariq PA, Choudhry S Rota Virus Gastroenteritis in Children Upto Five years of Age. *JRMC*;2010;14(1):33-5.
3. Rossignol JF, Chegne N, Julcamoro LM, Carrion ME, Bardin MC Nitazoxanide for the empiric treatment of pediatric infectious diarrhea. *Transact Royal Society of Trop Med Hygiene* 2012;106(3):167-73.
4. McLeod C, Morris PS, Snelling TL, Carapetis JR, Bowen AC Nitazoxanide for the treatment of infectious diarrhea in the Northern Territory, Australia 2007-2012. *Rural and Remote Health* 2014;14: 2759.
5. Teran CG, Escalera CN, Villarroel P Nitazoxanide vs. probiotics for the treatment of acute rotavirus diarrhea in children: a randomized, single-blind, controlled trial in Bolivian children. *Int J Infect Dis* 2009;13:518-23.
6. Rossignol JF, Zekry M, Hussein A, Santoro MG Effect of nitazoxanide for treatment of severe rotavirus diarrhoea: randomised double-blind placebo-controlled trial. *Lancet* 2006;368:124-9.
7. Terana CG, Escaleraa CN, Villarroela P Nitazoxanide vs. probiotics for the treatment of acute rotavirus diarrhea in children: a randomized, single-blind, controlled trial in Bolivian children. *Int J Infectious Diseases* 2009;13:518-23.