

# Intussusception in infants in Ethiopia after Rotavirus Vaccination: Descriptive study done from six hospitals in Ethiopia

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## Background

Intussusception is invagination of a portion of intestine into another. (2–4) The peak age of occurrence is between the ages of 4 and 8 months. (3,5) Intussusception is one of the frequent causes of bowel obstruction in infants and toddlers. (1) In Ethiopia there is few data about of intussusception. Retrospective study was done in Tikur Anbessa Specialized Hospital(TASH). This was conducted as part of the surveillance to get the base line information. (A) It was found that there is a delay in presentation and the management was almost purely surgical. Another study done in 2014 in the institute, has revealed a significant increase in non operative management of Intussusception Black Lion Hospital. Which has reported the the hydrostatic reduction to to decrease the surgical intervention by three fourth with a success rate of 87 %.(B) This study was conducted as part of surveillance for intussusception following the introduction of ROTA vaccine. Ethiopia introduced rotavirus in November 2013 and started the Intussusception case based surveillance as part of Africa network in December 2013 with six sentinel sites in major hospitals Hence it includes only the cases during the infancy period i.e those under 12 months old. There were 14 hospital enrolled to to conduct the surveillance but 8 hospitals were dropped from the surveillance after they failed to report cases nearly for 1 year. It was conducted in six Hopitals . These include Tikur Anbessa Specialized Hospital (TASH), Assela Hospital, Dessie Hospital , Mekele Ayider Hospital, University of Gondar Hospital and Hawassa Referral Hospital. The Intussusception surveillance in Ethiopia is part of Africa Network to assess the association of Rotavirus vaccine and intussusception. The objective of the study is to do a descriptive study about the clinical presentation, mode of diagnosis, management options used, outcome of intussusception in Ethiopia. In this part of the study we will not try to look for any association between ROTA Vaccine and intussusception

## Methods

Intussusception surveillance in Ethiopia was conducted in six sentinel sites in the major hospital across Ethiopia geographically covering all over with population under 1 year's children. Investigation form was prepared which constitutes the identification, mode of diagnosis, Duration of Symptoms, history of referral, interventions done , outcome of the intervention done. Cases were detected from outpatient registry book, operation log book, in patient registry book, Intussusception cases meeting international (Brighton level 1) criteria were enrolled using active surveillance.

It includes the following

Demonstration of invagination of intestine at surgery (in absence of another primary cause such as volvulus or pyloric stenosis); **OR**

\_\_\_\_\_ Demonstration of invagination of intestine by air or liquid contrast enema; **OR**

\_\_\_\_\_ Demonstration of an intra-abdominal mass by abdominal ultrasound with specific criteria, that is proved to be reduced by hydrostatic enema on post-reduction ultrasound;  
Specific criteria are:

-- Transverse section: target sign or doughnut sign

-- Longitudinal section: pseudo-kidney or sandwich sign; **OR**

## Demonstration of invagination of intestine at autopsy

Relevant statistical tests were made and data were summarized in tables.

### Results

Total of 175 cases with intussusception and confirmed vaccination card copy were analyzed. One third of the enrolled cases were from TASH (SEE table). Majority of the cases are between age group 6-8 months 76 (43.43%) (See Table 1) It is more common in males (60%) with M: F ratio 1.53:1. Ultrasound was used as diagnostic tool in 145/175 (82%) of the cases( See table ). Ultrasound guided normal saline reduction of intussusception was done for 17(9.71%) all of these were reported from TASH and spontaneous resolution was reported in 6 (3.43%). Surgery is the main stay of treatment for intussusception in 142(81.14%). The length of stay in the hospital are 0-2 days 111(63.43%), 3-5 days 45(25.71%), 5-9 days 38(30.65), 10 days and above 24(19.35%). One case was observed in the 1-7 days and 3 cases in the 8-21 days post dose 1. No cases and 2 cases were observed in the 1-7 days and 8-21 days post dose 2. No elevated risk of intussusception was detected in the 1-7 days post dose 1 (relative incidence (RI): 0.86; 95% confidence interval (CI), <0.02-4.71). Similarly, no elevated risk was detected in the 1-7 days post-dose 2, 8-21 or 1-21 days post dose 1 or post dose 2. Death among the enrolled are 20 (11.43%) which Dessie Referral Hospital contributing 9(5.14%). Health seeking behavior was the major reason for high death rate i.e. duration of days from Onset to Admission 3-5 days 45(25.71%) and in Dessie Referral Hospital 14(8.00%)

### Discussion

There is no relation risk of intussusceptions following the rotavirus administration after for dose 1 and dose 2. card retention and the follow up for the second intussusception for less than 8 months of ages were difficult but managed. Treatment was done using surgery mostly and the hydrostatic reduction next especially in Black Lion hospital and this was a good experience to be taken to other sentinel sites.

Table 1 Age

	N= (%)
<b>Age distribution</b>	
0-2 months	12 (6.86%)
3-5 months	56(32.00%)
6-8 months	76(43.43%)
9-11 months	31(17.71%)

Table 2 Number of Intussusception Cases Enrolled by sentinel Sites

	N= (%)
<b>Sentinel Sites</b>	
Assela Hospital	20 (6.86%)
Ayeder Hospital	14(32.00%)
Black Line Hospital	52(43.43%)
Dessie Hospital	23(17.71%)
Gonder Hospital	35(20.00%)
Hawassa Hospital	31(17.71%)

Table 2 Sex

	N= (%)
<b>Sex</b>	
Male	106 (60.57%)
Female	69(39.43%)

Table 3 Number of days between symptom onsets to admission to facility

	N= (%)
<b>Number of days</b>	
0-2 days	111 (63.43%)
3-5 days	45(25.71%)
6-9 days	11(6.29%)
10 days and above	8(4.57%)

Table 4 Duration of stay in the health facility

	N= (%)
<b>Number of days</b>	
0-2 days	31 (25.00%)
3-5 days	41(33.06%)
6-9 days	28(22.58%)
10 days and above	24(19.35%)

Table 5 Diagnosis of Intussusception

	N= (%)
<b>Diagnosis</b>	
Clinical symptoms	164 (93.71%)
Enema	21(12.00%)
Ultrasound	145(22.58%)
Surgery	141(80.57%)

Table 6 Treatment of Intussusception

	N= (%)
Enema	17(9.71%)
Surgery	142(81.14%)

Table 7 Amon children with surgery 77 (54.43%) that required resection

<b>Resection performed</b>	N= (%)
Yes	77(54.43%)
No	52(36.62%)

Table 8 Outcome

	N= (%)
<b>Outcome</b>	
Discharged home	140 (80.00%)
Transferred	1(0.57%)
Died	20(11.43%)
Abandoned	0(0.00%)

Table 9 Risk Analysis after the first and second dose administered

	<b>Risk period (days)</b>	<b>N cases in risk period</b>	<b>Relative Incidence (95% CI)</b>
<b>Dose 1</b>	1-7	1	0.86 (<0.02, 4.71)
	8-21	3	3.45 (0.54, 7.37)
	1-21	4	
<b>Dose 2</b>	1-7	0	-
	8-21	2	2.04 (0.25, 7.18)
	1-21	2	2.04 (0.25, 7.18)

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DOI 10.1007/s10140-017-1546-y