

# INTUSSUSCEPTION IN A PRIVATE TERTIARY-CARE HOSPITAL, BANGKOK, THAILAND: A CASE SERIES

Prasong Pruksananonda<sup>1</sup>, Krairerk Athirakul<sup>1</sup>, Mingmuang Worawattanakul<sup>1</sup>,  
Wandee Varavithya<sup>2</sup>, Ampai Pisithpun<sup>1</sup>, Dwip Kitayaporn<sup>1</sup> and Sinn Anuras<sup>1</sup>

<sup>1</sup>Bumrungrad International Hospital, Bangkok; <sup>2</sup>Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

**Abstract.** This was a retrospective case series study of patients with intussusception at a private tertiary-care hospital in Bangkok, Thailand. The computerized hospital records of all 94 children aged 0-14 years diagnosed with intussusception from 2000 to 2005 were reviewed. About half (51.1%) were males, 23.4% were less than 1 year old. Most (78.7%) were Thai nationals. The highest case frequency was in August (n = 12, Poisson means = 7.8, 95% confidence interval 6.3-9.6). Of these, none had the classical triad of vomiting, colicky pain, and mucous bloody stools. Only 12.8% had fever; abdominal mass was detected in 4.3%, and 4.3% had increased bowel sounds, while 34.0% had no specific signs. The most frequent site of intussusception was the ileocolic (62.6%). Stool cultures for bacteria and stool for rotavirus antigen obtained in some cases revealed no significant findings. Of the cases, 10 (10.6%) had spontaneous reduction, 84 (89.4%) underwent barium enema intervention, 10 of the latter (11.9%) required further surgical intervention. There were no mortalities during the observation period. There were 10 recurrent events in this series. The 7-day recurrence-free probability was 84.9% (95% CI 49.2, 96.3%). This study provides baseline data regarding intussusception in Thailand which may be useful for future epidemiological and/or clinical studies.

## INTRODUCTION

Intussusception, a telescoping of one portion of the intestine into another, results in decreased blood supply of the involved segment and can obstruct the passage of contents through the intestine, and may include strangulation. The condition can progress from intestinal obstruction to necrosis of a segment of the intestine. Initially, blood flow through the intestine is decreased, causing swelling and inflammation. The swelling can lead to perforation and generalized abdominal infection. Shock and dehydration can occur rapidly, leading to mortality. Its cause is generally unclear.

The possible association between the rhesus-human rotavirus reassortant-tetravalent vaccine (RRV-TV) given as a routine immunization in the United States and intussusception in those vaccinated with this specific vaccine led to this vaccine's withdrawal from the markets after approximately 1 million doses had been given (Centers for Disease Control and Prevention, 2004; Haber *et al*, 2004).

An understanding of intussusception in the Asian population, is important where reports of intussusception are not commonly documented (Sutthiwan *et al*, 1982; Sangkathat *et al*, 1998; Lee *et al*, 2006; Nakagomi *et al*, 2006). We, therefore, present here a case-series of patients with intussusception presenting to Bumrungrad International Hospital, a private tertiary care hospital in Bangkok, Thailand.

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Correspondence: Dr Prasong Pruksananonda, Bumrungrad International Hospital, 33 Sukhumvit 3 (Nana Nua), Bangkok 10110, Thailand.  
Fax: +66 (0) 2667-2522  
E-mail: prasong@bumrungraddoctor.com

## MATERIALS AND METHODS

This retrospective study used data obtained from computerized hospital records (Hospital 2000 Software, Global Care Solutions Asia Pacific, Bangkok, Thailand) from Bumrungrad International (BI) Hospital, Bangkok, Thailand. Inclusion criteria were all children age birth to 14 years who presented to BI from 2000 to 2005, with the diagnosis of intussusception identified by the International Classification of Diseases, 10<sup>th</sup> revision (ICD-10). The stools of some of these subjects were studied for rotavirus antigen (Rotalex<sup>®</sup> test, Orion Diagnostica, Espoo, Finland) and stool cultures and other stool examination were obtained in some subjects. Study variables included demographics, symptoms, signs, laboratory investigations, imaging, therapy, and clinical outcomes. The study was approved by the Bumrungrad International Hospital Institutional Review Board. Data were analyzed using Intercooled Stata version 9.1 (StataCorp LP, College Station, TX, USA). The Kaplan-Meier method (Kaplan and Meier, 1958) was used to estimate recurrence-free probabilities;  $\alpha = 0.05$  (two-sided) was used for level of significance.

## RESULTS

Ninety-four children were admitted to the hospital from June 2000 to October 2005. Of these, 10 (10.6%) had recurrent episodes. About half (51.1%) were males, and their mean ( $\pm$  SD) age was 2.4 ( $\pm$  2.0) years (range 4.4 months - 12.0 years). Nearly half (48.9%) these children were 1-3 years old; and 23.4% were less than 1 year old. Most (78.7%) were Thai nationals, 5.3% were from the United States, 3.2% from United Arab Emirates, and 12.8% from other countries. The highest case frequency was in August ( $n = 12$ , Poisson means = 7.8, 95% confidence interval 6.3-9.6). The median length of stay was 2 days (range 1-7 days). Most (75.5%) had abdominal pain as their chief complaint, 18.1% had vomiting, and

62.8% presented to the hospital within one day of experiencing symptoms. Of these children, only 12.8% had fever (body temperature  $\geq 37.8^\circ\text{C}$ ). Interestingly, 34.0% had no specific signs, 5.3% showed signs of dehydration, an abdominal mass was detected in 4.3%, and 4.3% had increased bowel sounds; the rest (52.1%) had no specific signs.

Of the 94 cases, 24 (25.5%) stool samples were collected for red blood cell examination, of which 62.5% had negative results, 12.5% had 0-1 red blood cells/high power field (RBC/HPF) and the rest (25.0%) had at least 1-2 RBC/HPF. The stool white blood cell (WBC) findings in the same persons were negative in 45.8%; 20.8% had 0-1 WBC/HPF, and 33.4% had at least 1-2 WBC/HPF. Stool occult blood was negative in 20.8%, 25% had trace occult blood, 20.8% had +4 test results, and 33.4% had in-between positive results. Bacteriological cultures were obtained in 19 (20.2%) cases, 68.4% had normal flora, 21.0% had enteropathogenic *Escherichia coli* (EPEC), and one of these EPEC-positive patients had *Salmonella* group B. All stool specimens sent for rotavirus antigen (7/94) were negative. Routine complete blood counts (CBC), kidney function tests and electrolytes were normal (data not shown). On 91 ultrasound studies (97.9%), 98.9% had evidence of intussusception; the most frequent site was ileocolic (62.6%).

Of the 94 cases, 10 (10.6%) had spontaneous reduction, 84 (89.4%) underwent barium enema intervention; 10 of the latter (11.9%) required further surgical intervention. There were no mortalities.

There were 10 recurrent events in this series. We estimated the recurrence-free probability. The median time to the first recurrence was 7.5 months, with a one-year recurrence-free probability of 36.4% (95% CI 8.8, 65.7%). Since 84.9% (95% CI 49.2, 96.3%) of our patients neither recurred nor returned within one week, our data had too few denomina-

tors. Of these 10 recurrent cases, one recurred twice and another thrice. The case with two recurrences was given the diagnosis of malignant lymphoma of the gastrointestinal tract. There were no statistically or clinically significant differences in CBC, kidney function tests, or electrolytes between these two clinical entities ( $p > 0.05$ , data not shown).

## DISCUSSION

The current study describes the clinical course of intussusception among Thai children in a large private hospital in Bangkok, Thailand. We did not find any clear peak in age distribution in late infancy, but there appeared to be a peak in cases during the Thai rainy season. These findings are not consistent with those of other recently reported series in many countries (Al-Malki, 2005; Justice *et al*, 2005; Ho *et al*, 2005; Nakagomi *et al*, 2006) and are not consistent with the epidemiology of rotavirus infection in Thailand (Maneekarn and Ushijima, 2000). There was no rotavirus vaccine approved for use in Thailand during the study period.

None of the classical clinical triad (vomiting, mucous bloody "currant jelly" stool, and abdominal pain) for intussusception (Huppertz *et al*, 2006) were found in our study. The patients presented with symptoms of vomiting and abdominal pain in the absence of mucous bloody stool, which is common in children with acute gastroenteritis. This presentation can cause a delay in the diagnosis of intussusception. One possible explanation for this phenomenon is that this was a private-sector referral hospital where other health concerns may be more immediate, however 62.8% of patients were evaluated within one day. Most of the cases (89.4%) either resolved spontaneously (10.6%) or resolved with barium enema (78.8%). The remainder (10.6%) required surgical intervention. Our morbidity data were lower than those of two other provinces in Thailand (Sangkhatthath *et al*, 1998; Dulayachai

*et al*, 2004) and of some other countries (Al-Malki, 2005; Ho *et al*, 2005). Our mortality rates were also lower (Parashar *et al*, 2000). Possible explanations include patient early access to care and the hospital's diagnostic and treatment facilities. The treatment team included pediatricians, radiologists, pediatric surgeons and associated health care staff.

Stool bacteriological and rotavirus studies revealed no significant association with intussusception, similar to studies from Mexico (Velazquez *et al*, 2004) and New Zealand (Chen *et al*, 2005). Although some abnormal anatomical conditions, such as Meckel's diverticulum, may be associated with intussusception, no such conditions were found in the current study; however, one recurrent case was diagnosed with malignancy. It is noteworthy that recurrence is possible after the first week and our recurrence rates were similar to those reported for Thailand (Huppertz *et al*, 2006) and Hong Kong (Nelson *et al*, 2002).

This case-series studied intussusception patients admitted to a private tertiary-care hospital in Bangkok. No association between stool studies for bacterial or rotavirus and intussusception was noted. The information obtained from this study regarding the findings, treatment outcomes, and recurrence, should provide backgrounds for further clinical or epidemiological studies.

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