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Gastro-enteritis and ileus in two children in Suriname: the multiple effects of Guava leaves

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ABSTRACT:

— ***Introduction:*** Diarrhea, gastro-enteritis and parasitic infections are highly prevalent in many parts of the world, especially in developing countries. About 1.5 million children die every year due to diarrhea. Diarrhea can be triggered by various enteric pathogens including viruses, bacteria and protozoa. *Psidium guajava* is a plant that is indigenous in Central America and parts of South America. In these tropical and subtropical countries, the guava plant is used as a food crop and as a medicinal plant. In the inland of Suriname it is used against diarrhea and other gastrointestinal symptoms. In a week's time, two children were admitted to the ward with a suspicion of ileus after usage of a decoction of guava leaves for gastro-enteritis.

— ***Cases: :*** Two cases of patients are described who presented at the emergency room with a distended abdomen after usage of guava leaves decoction for gastro-enteritis. Abdominal x-rays showed in both cases suspicion of an ileus with a dilated colon and fluid levels. Feces cultures were negative for *Salmonella, Shigella* and *Campylobacter.* A nasogastric tube was placed; the patients were given nil per os and intravenous rehydration therapy. After a few days they were discharged in a clinical good condition.

— ***Discussion:*** Diarrhea and gastroenteritis are usually treated with commercially available drugs or traditional medicine remedies. This is the first time that ileus after using a guava leaves decoction is described, while ileus is a known complication after using commercial anti-diarrheal agents. Previous studies showed that *Psidium guajava* actually has an anti-diarrheal and anti-motility effect. This anti-motility effect might be the cause of the ileus. This case report also mentions the importance of being aware of the usage of alternative medicine and its side effects, especially in tropical countries.

— ***Keywords:*** Pediatrics, Ileus, Guava, *Psidium guajava*, Tropical medicine, Gastro-Enteritis, Children, Traditional medicine.

INTRODUCTION

Traditional medicine plays an important role in health care of inhabitants of the inland of Suriname. These plants are used to cure illnesses, promote health and for the prevention of diseases[1]. *Psidium guajava* is a medicinal plant used in tropical and subtropical countries, especially throughout Latin America and the Caribbean. It is used as a therapy for numerous diseases, such as diabetes, hypertension, diarrhea, anti-inflammatory diseases and dermatological problems. Different parts of *Psidium guajava* are used as a treatment. Leaves can be applied externally on the skin for dermatological problems. A decoction of leaves alone or in combination with barks, roots and shoots is used for gastro-enteritis, wounds, ulcers, diabetes mellitus, hypertension and autoimmune disorders[2]. Diarrhea is the second leading cause of death among children under five years old worldwide. About 1.5 million children die every year due to diarrhea[3]. In the inland of Suriname, indigenous

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people drink decoctions of guava leaves when suffering from diarrhea[1]. Birdi et al[4] shows that *Psidium guajava* has antibacterial activity against bacteria that are involved in gastro-enteritis and motility tests show a reduction of motility after ingestion of *Psidium guajava*[5]. Ileus is described as a complication after use of regular anti-diarrheal agents such as hydrochloride (loperamide)[6]. No case reports were found in literature about ileus after the use of guava leaves. This case report investigates two cases within one week at the Academic hospital Paramaribo in Suriname. Ileus is a potential life threatening condition, which needs immediate investigation and intervention[6]. It has a broad differential diagnoses and this case report highlights a less common cause. We also mention the importance of being aware of the usage of alternative medicine, especially in tropical countries.

CASE REPORT 1

A 4-year-old girl with no significant medical history presented at the emergency room with a two-day period of watery diarrhea and fever. There were no signs of blood or mucus in the stool. The girl vomited only after coughing. Her grandmother made juice from guava leaves and let her drink it once. One day later the grandmother brought the girl to the doctor because her abdomen got distended. Two days later they visited the Emergency Room. Physical examination at the Emergency Room revealed a distended abdomen with hypoactive bowel sounds on auscultation. The abdomen was hypertympanic, without significant tenderness. Abdominal x-ray showed a dilated colon and air fluid levels and a suspicion of distal bowel obstruction (Figure 1). The patient was admitted to the ward for intravenous rehydration and a nasogastric tube to relieve the stomach and intestines. Feces were not cultured for bacteria, ova or parasites. During hospitalization defecation normalized, the abdomen was not distended anymore and she started a normal feeding patron. After two days the patient had been discharged and when the patient came to the outpatient clinic one month later no complaints were mentioned.

CASE REPORT 2

An almost 2-year-old boy with no significant medical history presented at the Emergency Room with a 5-day history of frequent watery diarrhea (without blood), vomiting and fever. The parents explained the boy had stayed with family in the inland of Suriname, where his aunt made an extraction of guava leaves and gave this once to the boy. One day later his abdomen got distended and the family brought him to the hospital. Exam revealed a distended, hypertympanic abdomen without tenderness and a mild dehydration. X-ray showed suspicion for an ileus. The patient was admitted to the hospital, where intravenous rehydration therapy was started and a nasogastric tube placed to decompensate stomach and intestines. During hospitalization the abdomen was not distended anymore and defecation normalized. Feces cultures were negative for *Salmonella, Shigella* and *Campylobacter*. Feces were not cultured for ova or parasites. After 5 days the patient was discharged home.

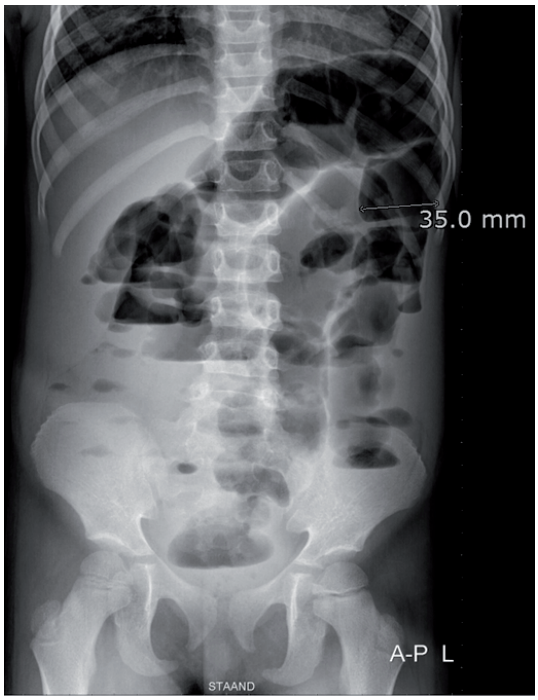

Figure 1. Abdominal x ray of the patient mentioned in case report 1.

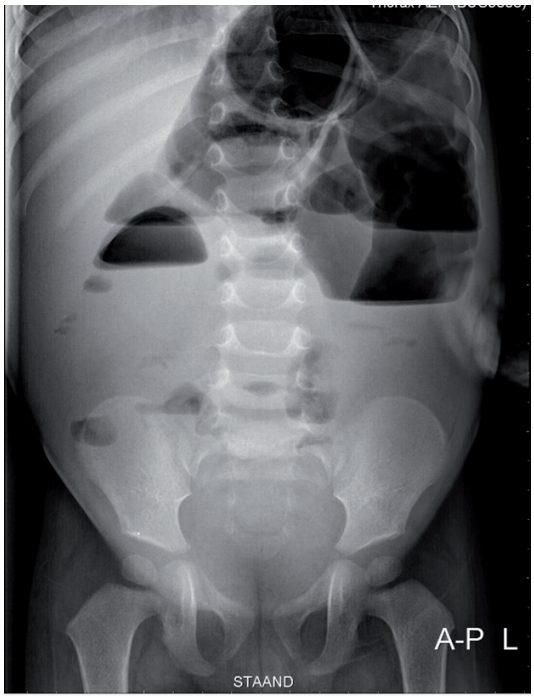

Figure 2. Abdominal x ray of the patient mentioned in case report 2.

DISCUSSION

In a short period of time there have been two patients with ileus after ingestion of guava leaves at the pediatric ward in Suriname. Ileus as a complication after ingestion of a decoction of guava leaves has not been described in literature before. Although a causal relation between ileus and guava leaves cannot be proven in these cases, it is likely that the guava leaves caused the ileus because ileus is described as a side effect of other anti-diarrheal agents[6].

Diarrhea is the second leading cause of death among children under five years old worldwide. About 1.5 million children die every year due to diarrhea[3]. Diarrhea can be triggered by various enteric pathogens including viruses, bacteria and protozoa. The mechanisms of microbial diarrhea are caused by different virulence traits. Adherence and invasion of the microbe to and in the intestinal cell, production of enterotoxins and cytotoxins are involving mechanisms of diarrhea[7].

The antimicrobial effect of guava extracts is tested on *Staphylococcus aureus*, *Salmonella spp.* and *Escherichia Coli* by Goncalves et al[8]. They showed that guava leave extracts have an inhibitory effect on the growth of these bacteria. The extracts were most active against *Staphylococcus aureus*. Compared to commercial antibiotics, the inhibitory effect of guava leaves was smaller[8].

Birdi et al[4] investigated the mechanisms of action of *Psidium guajava* leaves in infectious diarrhea. They looked at the antibacterial activity of a decoction of Psidium guajava against bacteria that can cause diarrhea. They found that the growth of *Shigella Flexneri* and *Vibrio Cholerae* is reduced, *in vitro*. There was no effect on the growth of different strains of *Escherichia coli* bacteria. They also studied the effect on adherence and invasion of bacteria *in vitro.* A decoction of Psidium guajava inhibited the adherence of EPEC (enteropathogenic *e. coli)* and invasion by EIEC and *S. flexneri*[4].

The anti-diarrheal effect is not only because of the antibiotic effect of *Psidium guajava*. Gastrointestinal motility tests show that there is a reduction of motility after ingestion of *Psidium guajava* compared to control treatments[5]. Histopathological research showed that tissues treated with *Psidium guajava* demonstrated anti-inflammatory and anti-secretory properties. *In vivo,* in mice it is shown that *Psidium guajava* is active as prevention and treatment of infections with V. cholera[9].

Medicinal plants are used in health care in many developing countries. This case report illustrates the side effects of oso dresie (local herbs and plants/traditional medicine) and the importance of taking this into account when asking about the use of it in the medical history in (sub)tropical countries. This alternative or plant medicine can cause complications and side effects as well as regular medicine. Furthermore, this case report highlights that guava or guava leaves can be a possible cause of ileus.

Conflict of Interest:
Both authors do not have conflicts of interests by publishing this article. The corresponding author is authorized to act on behalf of all authors.

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