CASE REPORT

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An unusual cause of hypertension

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ABSTRACT

Introduction: Hypertension is not common in infants and young children. The etiology of hypertension in this age group may be different from older children and young adults. Hypertension may be associated with intussusception in young children. **Case Report:** A previously healthy 17-month-old, ill-appearing and dehydrated girl was brought to the emergency department with fever and vomiting for three days. The vomiting was non-bilious and non-projectile. Her temperature was 103°F, heart rate was 126/min, respiratory rate was 32/min, oxygen saturation 98% and blood pressure 122/77 mmHg. She had dry mucous membranes. The abdomen was soft with mild tenderness in the left upper quadrant and no palpable masses. She was diagnosed with ileocolic intussusception. **Conclusion:** Intussusception should be considered a diagnostic possibility in infants who have a history of vomiting and in whom lethargy and hypertension are the presenting features. This case report demonstrates the importance of measuring blood pressure in ill-appearing children.

Keywords: Hypertension, Intussusception, Diagnostic features

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INTRODUCTION

Hypertension in children is defined as blood pressure measurements above the 95th percentile for age, gender and height of the patient. Blood pressure is not routinely measured in infants and young children in the emergency department, though measurement should be obtained in ill appearing young children. Unlike adults and adolescents, hypertension in an infant or young child is usually indicative of an underlying condition, therefore, a careful search should be conducted. Renal disorders and coarctation of the aorta are the two most common causes of hypertension in young children. The association of hypertension and intussusception has been described in the past, being characterized as transient and usually resolving after the reduction of intussusception.

CASE REPORT

A previously healthy 17-month-old girl was brought to the emergency department with fever and vomiting for three days. The vomiting was non-bilious and non-projectile. She had no diarrhea but parents reported her crying more than usual for last two days. On the day of presentation, her parents also noted that “she was less active”. Her parents denied sick contacts and any travel history. Her immunization was current. There was no family history of hypertension.

On arrival at the emergency department she was dehydrated and ill-appearing. Her temperature was 103°F, heart rate was 126/min, respiratory rate was 32/min, oxygen saturation was 98% and blood pressure was 122/77 mmHg. She had dry mucous membranes. There were no meningeal signs. Pupils were equal and reactive, and extra-ocular movements were intact. Her chest was clear. The abdomen was soft with mild tenderness in the left upper quadrant. There were no palpable masses. Her initial stool was negative for occult blood. There was no peripheral edema. No skin lesions or rashes were noted. There were no focal abnormal findings on neurological examination.

Laboratory studies showed a white blood cell count of $8.9 \times 10^3/\text{mm}^3$ with a normal differential count and a hematocrit of 33.2%. Her urinalysis showed specific gravity of 1.043 and 3+ ketones. Serum biochemistries revealed sodium 141 mEq/L, potassium 4.6 mEq/L, chloride 107 mEq/L, CO₂ 19 mEq/L, urea 15 mg/dL, creatinine 0.6 mg/dL, glucose 74 mg/dL and calcium 9.3 mg/dL. Due to persistent vomiting, a plain X-ray of abdomen was obtained, which showed non-specific pattern and paucity of bowel gas (Figure 1).

The patient was initially treated with intravenous fluids to correct dehydration. Her clinical condition improved after hydration but blood pressure remained 120/76 mmHg. An abdominal ultrasound was obtained which showed a normal urinary tract and intussusception in the mid transverse colon (Figure 2). Subsequently, a barium enema was performed which successfully reduced the ileocolic intussusception. Her

Figure 2: Abdominal ultrasound showing intussusception in the mid transverse colon.

blood pressure returned to normal after reduction of the intussusception. She was discharged home in stable condition two days after the procedure.

DISCUSSION

The differential diagnosis of a child with fever, lethargy and vomiting is broad. In addition, the presence of hypertension in a young child may make this list more extensive. Since hypertension is not a common problem in a pediatric emergency department, presence of hypertension in a young child may pose a diagnostic challenge.

Unlike adults and adolescents, hypertension in an infant or young child is usually indicative of an underlying condition, therefore a careful search should be conducted. Emergency physicians are often the first to evaluate these children. It is important to recognize the underlying causes of hypertension in this age group.

Hypertension in children is defined as blood pressure measurements above the 95th percentile for age, gender and height of the patient. Standard nomograms, based on the above factors, are necessary for the interpretations of blood pressure values. Inappropriate cuff size is the most common cause of hypertension in children, thus selection of an arm cuff of the right size is necessary for accurate measurement of blood pressure [1]. An appropriate cuff size should have an inflatable bladder width which is at least 40% of the arm circumference at a point midway between the olecranon and the acromion; and cuff bladder length should also cover 80–100% of the circumference of the arm [2]. Recommended cuff sizes are as follows: neonates (2.5 cm), infants (5 cm), 1–8 years (9 cm) and 9–14 years (12.5 cm).

This case report raises the question whether blood pressure is measured routinely in children less than three years of age. Generally, blood pressure is not routinely measured in infants and young children in the emergency department [3, 4]. However, blood pressure

Figure 1: Plain abdominal X-ray showing non-specific pattern and paucity of bowel gas.

measurement should be obtained in all ill appearing young children.

Essential hypertension is very rare in children and should be considered only after exclusion of other causes. Renal disorders and coarctation of the aorta are the two most common causes of hypertension in young children. Blood pressure should be obtained in the upper and lower extremities to rule out coarctation of the aorta. In addition, a transient rise in blood pressure may be seen in the presence of stress, crying or pain. Therefore, the diagnosis of hypertension in a child should be made only after resolution of these causes.

Hypertension may be associated with intussusception. The association of hypertension and intussusception has been described in the past, but only a few case reports exist in literature [5, 6]. Hypertension is transient and usually resolves after reduction of intussusception. Therefore, intussusception should be considered a diagnostic possibility in infants who have a history of vomiting, and in whom lethargy and hypertension are the presenting features. This case report highlights the importance of measuring blood pressure in ill-appearing children.

CONCLUSION

The association of hypertension and intussusception has been described in the past. Intussusception should be considered a diagnostic possibility in infants who have a history of vomiting and in whom lethargy and hypertension are the presenting features. This case report demonstrates the importance of measuring blood pressure in ill-appearing children in the emergency department.

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Author Contributions

Muhammad Waseem – Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published

Evelyn Erickson – Acquisition of data, Drafting the article, Critical revision of the article, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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