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First Attack Hypertensive Crisis in Children with Primary Hypertension: A Case Report

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ABSTRACT

Hypertensive crisis in children is relatively a rare condition and the prevalence is currently unknown [(1)]. The most common etiology of hypertensive crisis is secondary hypertension, while primary hypertension is less common [(2)(5)(7)]. We performed a case report of 13 years old boy with hypertensive crisis caused by primary hypertension. He came to emergency unit of our hospital due to epistaxis, nausea, vomiting and abdominal pain. On the physical examination we found that the blood pressure was 180/110, his body weight was 60kg, the height was 154cm, and the BMI was 25,2 (categorized as overweight). The history of hypertension in his family was positive. On the further examination, the results of the laboratory finding, urinalysis and thorax x-ray was within normal limit. In the emergency unit, the patient was treated with nifedipine 5mg sublingual, furosemide injection 30mg. Patient was hospitalized at observational unit and discharged in fifth day with improvement and the blood pressure was 120/80.

ARTICLE DETAILS

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BACKGROUND

Hypertension in pediatrics is defined as repeated systolic or diastolic BP>95th percentile for youth ages 1 to 12 and BP >130/80 mm Hg for youth ages 13 years and older [(3)]. The prevalence of pediatric hypertension is increase in the past of two decades, with a relative increasing rate is from 75% to 79% during 2000-2015[(4).]

Hypertensive crisis in children relatively is rare condition and the prevalence is currently unknown [(1)]. Hypertensive crisis is defined as severe elevation in blood pressure that is life threatening and has potency to cause rapid end-organ damage [(5)]. Hypertensive crisis can be subcategorized as hypertensive urgency and emergency. Hypertensive urgency is condition when there is no sign of end-organ damage. On the other hand, hypertensive emergency, is condition when there are signs of end organ damage such as headache, nausea, vomiting [(5)].

Hypertensive crisis can be caused by primary hypertension or secondary hypertension. The most common etiology is secondary hypertension [(4)]. Secondary hypertension is hypertension that caused by underlying disease such as renal disorder including renal parenchymal disease and renovascular disease, drug induced hypertension, cardiovascular disease, endocrine disorder, and nervous system disorder [(4)]. Secondary hypertension is the most common etiology of hypertension in neonates and young children <6 years old [(6)(8)]. Primary hypertension is hypertension that has no known cause but is associated with several risk factors, including family history and higher body mass index [(6)(9)]. Primary hypertension usually occurs in children >6 years old [(6)(10)]. Hypertensive crisis potentially can cause serious end-organ damage, so it must be treated promptly. We performed a case hypertensive crisis in 13 years old boy with primary hypertension, he has no history of hypertension before and no underlying disease.

CASE PRESENTATION

A 13th years old boy came to the emergency unit of our hospital due to epistaxis on 30 minutes before. When he arrived in hospital, the epistaxis was already stop. He also had symptoms of abdominal pain, nausea and vomiting. Headache was negative. Defecation and flatus were normal. He had no symptoms of dyspneu or oedema. He had no underlying disease before. On the physical examination, the blood pressure was 180/110 mmHg, HR 120x/m, Rr: 20x/m, T: 36,8. His body weight was 60kg, height was 154cm., BMI 25,2 which categorized as overweight. Epigastric pain was positive. On the further anamnesis, we found that the history of hypertension in family was positive. His laboratory findings of complete blood count, blood glucose,

lipid profile, renal function was shown in the table 1. The urinalysis was within normal limit. The thorax x-ray was within normal limits. In the emergency department the patient treated with Nifedipine sublingual 5mg, furosemide injection 30mg, ondansetron, ranitidine and metamizole injection. His blood pressure was down to 130/80. Patient was hospitalized in observational unit. During hospitalization the patient treated with furosemide injection 3x30mg and captopril tablet 3x12,5mg. On the third day, the furosemide injection change into oral furosemide 2x40mg. The patient discharge on the fifth day with improvement of blood pressure at 120/80 and receive oral therapy of furosemide 2x40mg and captopril 3x12,5mg.

Table 1.

Laboratory examination	Laboratory findings	Normal Value
Hb	15.2	12.9-14.2
Leukocyte	13.8	3.7-10.1
Thrombocyte	455	155-366
HCT	49.2	37.7-57.7
Randomized blood glucose	117	70-125
Triglyceride	113	150
Total Cholesterol	172	200
HDL	54	>35
LDL	103	150
BUN	10	8-26
Creatinine	0,61	M: 0,7-1,3 W: 0,6-1,1

DISCUSSION

Hypertensive crisis is a life-threatening condition and has potency to cause rapid end-organ damage, so it must be treated promptly. The most common etiology of hypertensive crisis in children is secondary hypertension [(5)(7)]. Previous research conducted by Yang et, all shown that the major underlying cause of first attack hypertensive crisis is renal disease, and could induce at any age [(11)]. Meanwhile, in this patient, the etiology of first attack hypertensive crisis was primary hypertension. There were no underlying causes of hypertension that found in this patient.

Risk factors of primary hypertension in pediatric patient are low birth weight, male sex, African-American ethnicity, sedentary life, excessive salt intake, family history of hypertension, overweight and obesity [(12)(13)(14)(15)]. The risk factors of hypertension in this patient were family history of hypertension and overweight.

Symptoms of hypertensive crisis are non-specific, ranging from entirely asymptomatic to severely disabled [(5)(7)]. Acute neurological signs are the most common symptoms with headache (54.5%), followed by dizziness (45.5%), nausea/vomiting (36.4%), and chest pain (29.1%) [(7)(11)]. Epistaxis is also a symptom of end-organ damage in crisis hypertension patients [(12)]. The symptoms of end-organ damage in this patient are epistaxis, nausea, and vomiting.

The management of a hypertensive crisis must be prompt. The principal goal of a hypertensive crisis is to reduce blood pressure and prevent end-organ damage. American Academy of Pediatrics (AAP) recommendation for treatment goals with nonpharmacologic and pharmacologic therapy should be a reduction in SBP and DBP to <90th percentile and <130/80mm Hg in adolescents ≥13 years of age [(16)]. The rate of reduction is no more than 25% of SBP in the first 6-8 hours, followed by a gradual return to normal BP over 26 to 48 hours [(16)(17)].

Based on AAP guidelines, treatment should be started with oral agents if the patient can tolerate oral therapy and if life-threatening complications have not yet developed. Intravenous agents indicate when oral administration is not possible due to the patient's clinical status or when a serious complication has already developed [(16)]. Some antihypertensive agents usually used in hypertensive crises are sodium nitroprusside, nicardipine, esmolol, labetalol, and hydralazine in intravenous preparation. Clonidine, hydralazine, isradipine, and minoxidil are oral drugs usually use in hypertensive crises [(16)]. Currently, there is no agreement on which drug is the most effective and safe to use as a first line in a hypertensive crisis [(18)].

Nifedipine was an antihypertensive agent used routinely for treating hypertensive crises, although not listed among the drugs recommended by most recent guidelines. The restrospective cohort study reported that oral nifedipine (62.1%) was the most frequently used antihypertensive for treated hypertensive crises and no known significant adverse events related to the use of nifedipine in the patients from that study [(18)(19)]. An initial dose of nifedipine less than 0.25 mg/kg was safe and effective, and no clinically significant side effects were noted [(20)].

CONCLUSION

Hypertensive crisis is a rare condition. Although the most common etiology is secondary hypertension, primary hypertension also can be the etiology. Sometimes primary hypertension is detected accidentally, like in this patient. With the increasing of hypertension cases in pediatrics, clinicians should be aware of hypertension in youth age children who has risk factors of hypertension such as being overweight, obese, and family history of hypertension.

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