Hypertension in children in emergency department

Abdolghader Pakniyat1, Parsa Yousefichaijan2*, Ramin Parvizrad3, Morteza Qaribi1

1Student Research Committee, Emergency Medicine Department, Arak University of Medical Sciences, Arak, Iran
2Associated Professor, Department of Pediatric Nephrology, Arak University of Medical Sciences, Arak, Iran
3Assistant Professor, Department of Emergency Medicine, School of Medicine, Arak University of Medical Sciences, Arak, Iran

Implication for health policy/practice/research/medical education:
Pediatric hypertension is increasing and the incidence of hypertension in the pediatric population. Although reading blood pressure for children is difficult, but it is not be missed by emergency physicians. The emergency physician must certify adequate follow-up for asymptomatic mild hypertension without end organ damage. In contrast hypertension crisis needs evaluation and initiation of treatment in the emergency departments and blood pressure reduction should be performed before the cause of the hypertension is known.

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Introduction
Pediatric hypertension is increasing due to high salt intake, childhood obesity, decrease physical activity, and hyperlipidemia. The incidence of hypertension in the pediatric population, assumed to be 2.5% to 5% (1). According to national consensus statement guideline (2004) a child with three or more blood pressure measurements above the 95th percentile for age, gender, and height should be considered hypertensive (2). Appropriate blood pressure cuff size and standard blood pressure nomograms is essential for accurate measurement of blood pressure levels. Oscillometric device may be used for blood pressure measurement, hence sometimes sphygmomanometer readings is difficult in emergency department (ED), particularly in small child but any abnormal reading should be repeated by auscultation. Although abnormal blood pressure reading is not uncommon due to children are stressed and agitated because of underlying illness or unfamiliar environment, but if repeated blood pressure level remain elevated, careful assessment and treatment should be performed (3,4).

Blood pressure is determined by both peripheral vascular resistance and cardiac output. Factors such as volume overload or sympathetic stimulation by tumors, renin-angiotensin system, drugs, or other processes, may have a main role in the development of hypertension (2,5). Essential hypertension presented with unspecific sign and symptom consist of headache, chest pain, falling asleep, daytime tiredness, and abdominal pain, also oral contraceptives, steriods, and illicit drugs (e.g., cocaine, amphetamines) should be asked in >10 years old children (6,7). The physician must perform a brief but through history and physical examination for the patients with persistently high blood pressure at ED. In the cases with mild to moderate hypertension without any concerning finding, it is recommended to giving educational guides about lifestyle modification and then refer the patients for fllow up with their family physician (1,8).

In cases with sever hypertension a careful history and physical examination must be performed. An appropriate history include frequency of urinary tract infections, dysuria, hematuria, frequency, unexplained fevers, edema, history of umbilical artery catheterization as neonate, history of head trauma, ingestion of illicit drugs, oral contraceptives, rapid withdrawal of hypertension drug agents, and history of flushing, sweating, fever, weight loss. In the physical examination should paying a particular attention to the cardiovascular system, neurological and renal system such as four-limb blood pressures, Heart rate, respiratory rate, heart sound, lung sound, oxygen saturation, funduscopic examination, neurologic examination, auscultation abdomen (4,5,7).

Evaluation of renal function, bone marrow response, pregnancy in pubertal girl, and urine drug screening is
The emergency physician must certify adequate follow-up for asymptomatic mild hypertension without end organ damage. In contrast, hypertension crisis needs evaluation and initiation of treatment in the ED and blood pressure reduction must be performed before the cause of the hypertension is known. Lifestyle modification for obesity, low-salt diet, exercise and avoiding stress is effective for treatment of hypertension, particularly if it is begun from childhood.

**Conclusion**

It is not unusual that a child presenting to the ED with elevation in blood pressure levels. Although reading blood pressure for children is difficult, but it is not be missed by emergency physicians. Children presenting to the ED maybe have hypertension, it is reasonable to repeat blood pressure level reading after patients rest or acclimation to the environment. Occasionally, however, the elevation in blood pressure levels will be sustained.

**Conflicts of interest**

The authors declared no competing interests.

**Authors’ contribution**

All authors contributed equally and signed the manuscript.

**Ethical considerations**

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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