



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Effectiveness of an electronic data processing system in diagnosing hypertension in children and adolescents.

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Objectives : The primary objective was to investigate differences in the proportion of children diagnosed with hypertension before and after implementation of the CDS in the hospital system. The secondary objective was to identify risk factors for HT among children in the outpatient setting.

Methods : A retrospective chart review was conducted in children and adolescents aged 3-18 years who had at least three visits to the pediatric outpatient department of the studied institution from January 2023 to December 2024. Patients previously diagnosed with hypertension or with incomplete blood pressure data were excluded. This study compared the proportional differences in physician-made HT diagnoses before and after implementation of the CDS.

Results : A total of 4,734 patients were included in the final analysis, comprising 2,356 patients in the pre-implementation phase and 2,378 patients in the post-implementation phase. The mean age for the overall cohort was 106.6 ± 43.9 months. Approximately 22.3% of the cohort was obese and severely obese. The prevalence of hypertension in this study was 22.6%. The proportions of children with hypertension and elevated blood pressure were not significantly different between groups ($p = 0.113$). There was a statistically significant difference in the proportion of physician-made diagnoses after implementation of the CDS, with an increasing trend of correct diagnoses and a decreasing trend of overdiagnosis ($p < 0.001$). Children with obesity were more likely to be hypertensive.

Conclusions : CDS may serve as a useful tool for early recognition of pediatric HT. This may reduce delays in diagnosis and intervention and ultimately reduce long-term consequences.

Table 1.jpg



Table 1: Demographics comparison between children with and without hypertension

Factors	Without HT N = 3,664 ¹	With HT N = 1,070 ¹	P-value ²
Age (months)	109.8 (± 44.2)	95.7 (± 41.0)	< 0.001
Sex			< 0.001
Female	1,964 (53.6%)	414 (38.7%)	
Male	1,700 (46.4%)	656 (61.3%)	
Weight (kg)	33.3 (± 17.4)	35.5 (± 22.2)	< 0.001
Height (cm)	131.3 (± 21.9)	126.2 (± 21.3)	< 0.001
Systolic blood pressure (mmHg)	103.1 (± 10.1)	113.3 (± 11.0)	<0.001
Diastolic blood pressure (mmHg)	63.0 (± 7.8)	71.7 (± 8.1)	<0.001
BMI			<0.001
Severe obesity	237 (6.5%)	211 (19.7%)	
Obesity	410 (11.2%)	197 (18.4%)	
Overweight	556 (15.1%)	170 (15.9%)	
Normal	2,282 (62.3%)	457 (42.7%)	
Thinness	140 (3.8%)	26 (2.4%)	
Severe thinness	39 (1.1%)	9 (0.8%)	
Citizens			0.539
Thai	3,593 (98.1%)	1,053 (98.4%)	
Non-Thai	71 (1.9%)	17 (1.6%)	
Nationality			0.313
Thai	3,596 (98.1%)	1,054 (98.5%)	
Non-Thai	68 (1.9%)	16 (1.5%)	

¹Mean (± SD); n (%)

²Welch's Two-sample t-test; Pearson's chi-square test

BMI = body mass index; HT = hypertension

Non-Thai citizens include Burmese, Laotian, Cambodian, Nepali, and Chinese.

Table 1.jpg



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Table 2. Blood pressure status and the appropriateness of the diagnosis

Factors	Pre-implementation N = 2,356 ¹	Post- implementation N = 2,378 ¹	P- value ²
Blood pressure status			0.113
Hypertension	561 (23.8%)	509 (21.4%)	
Elevated BP	229 (9.7%)	225 (9.5%)	
Normal BP	1,566 (66.5%)	1,644 (69.1%)	
Physician-made diagnosis			0.001
Correct diagnosis	1,583 (67.2%)	1,670 (70.2%)	
Overdiagnosis	756 (32.1%)	689 (29.0%)	
Underdiagnosis	17 (0.2%)	19 (0.8%)	
Incorrect diagnosis	773 (32.8%)	708 (29.8%)	0.022

¹n (%)

²Pearson's chi-square test

BP = blood pressure