

ascertainment of hospitalizations. However, in contrast to large database epidemiology studies, this direct methodology probably had a greater sensitivity to find hospitalizations and extract meaningful data.

In conclusion, we found a strong and independent relationship between number of medication discrepancies and risk for subsequent 1-year hospitalizations in advanced CKD. This relationship could have important clinical implications. Further study of interventions to improve medication review and reconciliation in advanced CKD would be particularly helpful.

## DISCLOSURE

All the authors declared no competing interests.

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# The Psychosocial Impact of a Diagnosis of Hypertension in Pediatric Patients



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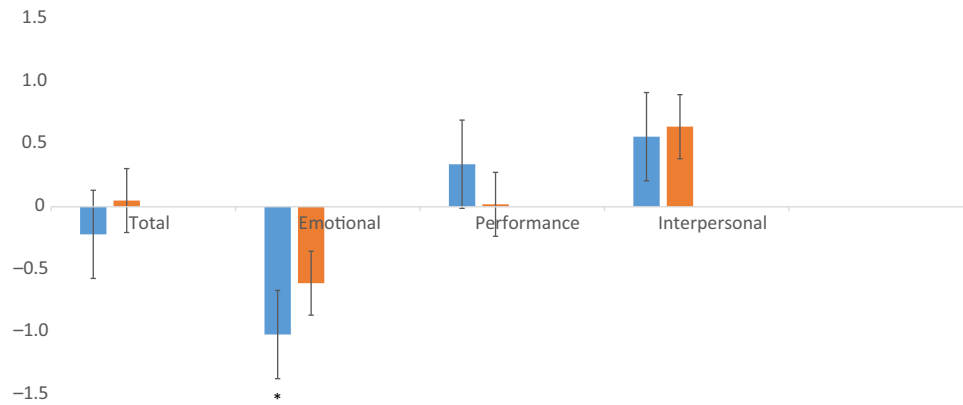
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The most recent US Preventive Services Task Force statement on hypertension (HTN) screening in the pediatric population states that “current evidence is insufficient to assess the balance of benefits and harms,” and suggests that blood pressure (BP) screening should not be routine practice in asymptomatic children.<sup>1</sup> The recommendation was based on inadequate evidence that routine screening in children is sufficiently accurate, that it identifies those who will have HTN or cardiovascular disease in adulthood, and the absence of studies documenting that treatment of HTN in childhood reduces cardiovascular morbidity

and mortality later in life. The US Preventive Services Task Force found minimal evidence to assess potential harms of routine BP screening, citing a single investigation of adverse effects of diagnosing children with HTN by measuring school absence rates.<sup>2</sup>

In contrast, the American Academy of Pediatrics and the American Heart Association recommend, based on Grade C evidence, measuring BP annually beginning at age 3 years in healthy children and adolescents without risk factors for HTN (e.g., family history, obesity, kidney disease, vascular anomalies, or use of medications that increase BP).<sup>3</sup> There is no mention of the



**Figure 1.** The bars indicate the mean score, blue patient scores and orange parental scores. Positive scores indicate perceived improvement since hypertension diagnosis, whereas negative scores indicate perceived decline since hypertension diagnosis. \* $P < 0.005$ .

psychosocial impact, either positive or negative, of establishing a diagnosis of HTN. In light of the uncertainty in this area, we conducted a pilot study to assess the psychosocial impact of making a diagnosis of HTN in asymptomatic children and adolescents.

## RESULTS

A total of 41 children and adolescents and 41 parents were enrolled during the period December 2014 to January 2018. For convenience, the survey was completed by the parent who accompanied the patient to the clinic and both the patient and accompanying parent completed the questionnaire at the same visit. Patient age was  $16 \pm 2$  years; 83% were male; 61% were white, 15% black, 12% Hispanic, and 12% other race/ethnicity; and body mass index was  $27.9 \pm 6.3$ . Most patients (73%) were in high school, 13% were in grade school, and 15% were attending college. Only 6 (15%) of the parents were single and 88% had at least some college education. Nineteen of 35 (54%) participants with available data were overweight/obese. The mean duration of the HTN was  $21 \pm 19$  months. Fifty-nine percent of patients were on treatment: diet alone in 8 (20%), exercise and weight reduction in 7 (17%), and medication in 18 (44%) cases. Two patients were treated with labetalol but none were given other emotion-modifying drugs, such as methamphetamines or clonidine.

Total scores and individual scores in the 3 subdomains (emotional, performance, and interpersonal) are illustrated in Figure 1. Patients reported lower emotional function after their HTN diagnosis,  $-1.02 \pm 2.05$ ,  $P = 0.0028$ , which was balanced by a trend toward higher interpersonal function,  $+0.56 \pm 2.18$ ,  $P = 0.11$ . The emotional domain subscore was comparable in participants with normal weight,  $-1.38 \pm 1.36$ , versus overweight/obese,  $-1.10 \pm 2.25$ . There was a trend to worse emotional function in untreated patients versus those receiving antihypertensive medications,  $-1.52 \pm 1.62$

versus  $-0.39 \pm 2.40$ ,  $P = 0.08$ . There was no alteration in patient-reported total or performance scores. The parents reported a trend toward lower patient emotional function since the HTN diagnosis,  $-0.61 \pm 2.12$  ( $P = 0.08$ ), that was also balanced by an increase in interpersonal function,  $+0.64 \pm 2.12$  ( $P = 0.07$ ). Similar to the patients, there was no alteration in total or performance scores reported by the parents. The psychosocial profile was similar in patients whether or not they were receiving antihypertensive medications or whether or not they had an abnormal body mass index (data not shown).

## DISCUSSION

In this single-center study, we found that patients perceived a significant reduction in their emotional function after being given an HTN diagnosis. Parents also reported this negative effect, although the perceived change was somewhat smaller than the patients' responses. No other functional domains were adversely influenced by the diagnosis of HTN. We hope to follow up on this pilot study to perform serial studies in patients to determine the impact of a diagnosis of HTN at the initial encounter, after a diagnosis of HTN is established, and longitudinally during the course of follow-up.

The impact of labeling pediatric patients as having high BP was assessed in 72 children, age 10 to 18 years, given a diagnosis of HTN. Absence rates were tabulated for the year before and after the HTN diagnosis was made and compared with 72 age- and sex-matched normotensive controls. There was no significant difference in absences between the groups.<sup>2</sup> Neither emotional nor psychosocial function was specifically addressed. In the nationwide German Health Interview and Examination Survey for Children and Adolescents, hypertensive adolescents had higher self- and parent-rated quality-of-life scores; however, the patients were unaware of the diagnosis of HTN.<sup>4</sup>

Our findings contrast with a previous report in which labeling adults as prehypertensive had no negative effects on their quality of life.<sup>5</sup> The impact of a diagnosis of high BP may relate to the degree of elevation of BP, with HTN perceived as more threatening than pre-HTN. Further, although HTN is more likely to be perceived as a routine health problem in adults, labeling children and adolescents with this less common diagnosis in their age group may have more adverse psychosocial consequences. Administration of anti-HTN medications may alleviate the emotional stress arising from a diagnosis of HTN.

There are several limitations to this study. It involves a limited patient sample at a single site. We did not survey children younger than 8 years, and assessment of the psychosocial impact of a diagnosis of HTN in this group may require design of a different instrument or test modality. In addition, in this pilot study, we did not administer the questionnaire to normotensive patients to address whether the psychosocial profile observed in the children with a diagnosis of hypertension differed from their healthy counterparts in the general population. We plan to do this in future studies. We acknowledge our inability to assess the psychosocial impact at the time when HTN was identified and reliance on recall of the effect. Although the survey was not validated, it was based on previous instruments used to address this question in other disease settings.<sup>6–8</sup> It was designed to address the domains that we anticipated might be affected by a diagnosis of hypertension. Nonetheless, it requires validation at other sites in larger samples in a wider range of health care settings. Future work comparing our questionnaire with established surveys, such as the Positive and Negative Affect Schedule scales, will help validate our instrument and extend the application of our findings. The isolated effect on emotional function is consistent with prior research in adults,<sup>9</sup> and was similar across patient and parent reports, suggesting that the finding is meaningful.

In conclusion, our observations suggest that BP screening cannot be dismissed as a totally innocuous test. Informing pediatric patients that they have high BP readings and labeling them as hypertensive may have an adverse impact on how they feel about themselves. The emotional effect needs to be taken into account in the design of screening programs to detect HTN in pediatric patients, regardless of the setting. It may be important to involve social workers and school

psychologists in the long-term care of hypertensive children to detect emotional dysfunction and to provide appropriate support.

## DISCLOSURE

All the authors declared no competing interests.

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## SUPPLEMENTARY MATERIAL

[Supplementary File \(Word\)](#)

[Supplementary Methods.](#)

[Supplementary Survey.](#)

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