

# Comorbidities of Patients with Hypertension Admitted to Emergency Departments in Florida Hospitals

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## ABSTRACT

*Although essential hypertension (EHT) tends to coexist with other conditions, few studies have focused on comorbidities and symptoms among patients admitted to emergency departments (ED). The objective was to compare the characteristics, comorbidities and symptoms among patients with three types (unspecified, benign, or malignant) of EHT in Florida. A public use data set of ED patients from the Florida Agency for Health Care Administration (AHCA) from 2005 was used. Records included those with primary diagnosis of three types of EHT based on the International Classification of Diseases, 9<sup>th</sup> edition (ICD-9) code. Group comparisons were made using Chi square tests and linear regression models. Of 34,625 records, 96.3%, 2.0%, and 1.7% of them had unspecified, benign and malignant EHT, respectively. Types of EHT varied significantly ( $p < .05$ ) by race/ethnicity, age group, health insurance status, discharge status, and length of stay. The most common secondary diagnoses included diabetes, abnormal lipid metabolism, hypokalemia, and anemia. Whereas diabetes without complication was the most common comorbidity of unspecified (10.7%) and malignant (12.6%) hypertensive patients, abnormal lipid metabolism was the most common co-morbidity of benign (20.0%) hypertensive patients. The most frequent symptom in all three groups was headache. About 60.0% (malignant), 34.6% (unspecified), and 4.2% (benign) of patients' main reason for ED visit were not related to their principal diagnosis. Variation in factors contributing to comorbidities between three types of EHT should be further explored.*

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## Introduction

High blood pressure (HBP) or hypertension (HT) is a risk factor for the two leading causes of death in the United States (US), heart disease and stroke. According to the Centers for Disease Control and Prevention (CDC), HBP continues to affect about one third of the US population (CDC, 2006). Moreover, HT was responsible for 7.8 deaths per 100,000 population in 2004 (CDC, 2004). Although there are several explanations for the high mortality and burden associated with HT, one possible reason may be due to the presence of multiple chronic conditions among hypertensive adults. For example, comorbidities such as diabetes and chronic kidney disease have been associated with uncontrolled blood pressure (BP) (Trioli et al., 2004; Majernick et al., 2004). Also, osteoarthritis and asthma have been detected in patients with HT (Wang et al., 2005). Hence, national and international HT management guidelines have recommended lower BP targets for individuals with target organ damage or other chronic conditions (Trioli et al., 2004).

Whereas there is vast research on the prevalence, treatment, and control of HT, comorbidities associated with HT are relatively understudied. Conceivably, patients admitted to the emergency department (ED) in hospitals for HT may have

greater levels of uncontrolled HT compared with the general population (Preston et al., 1999; Shayne & Pitts 2003; Karras et al., 2005). Patients admitted to the ED may present with conditions and symptoms not observed in other hypertensive adults who were not admitted to the ED. In addition, it is plausible that comorbidities and symptoms would vary by severity or subcategory of essential hypertension (EHT). Because the ED is likely to be the primary source of care for uninsured individuals, and uninsured hypertensive individuals have shown greater odds for uncontrolled BP, the ED provides a venue to assess hypertensive individuals with greater risk of HT complications (Tanabe et al., 2004; Duru et al., 2007). Furthermore, because Florida is one of the leading states in the country with a multi-ethnic population, and the control of HBP has been shown to vary by race and ethnicity, research on the prevalence of comorbidities among HT patients admitted in a Florida ED is warranted (U.S. Census Bureau, 2000; Hajjar & Kotchen, 2003). This study would be beneficial for future prevention programs targeting groups at higher risk for complications related to EHT. To the authors' knowledge, there are currently no published studies on comorbidity among individuals admitted in ED for EHT and its subtypes in Florida. This study examined the demographic

and clinical characteristics of patients admitted to the ED with EHT in Florida. Specifically, differences in comorbidities and symptoms between patients diagnosed with malignant, benign, and unspecified EHT were compared.

## Methods

### *Study Design*

This study examined patients admitted with primary diagnosis of EHT in emergency departments (ED) of Florida hospitals in 2005.

### *Setting*

The 2005 ED data from the Florida Agency for Health Care Administration (AHCA) were used. No personal identifiers appeared in the AHCA public use file. All patient records in 2005 that were verified by Florida hospitals and reported to AHCA by February 2007 were included. Florida hospitals have up to 18 months to check the accuracy of the data before sending the data to the AHCA. Therefore, the current data included all records of all Florida hospitals reported to the AHCA by February 2007.

### *Sample*

Records with primary diagnosis of three sub-categories of EHT based on the International Classification of Disease, 9<sup>th</sup> edition (ICD-9) code in 2005 were extracted. Specifically, ICD-9 codes of 401.0 or *malignant EHT*, 401.1 or *benign EHT*, and 401.9 or *unspecified EHT* were included. Malignant EHT is defined as severe HT characterized by necrosis of the small arteries and swelling of the optic nerve or papilledema, with diastolic BP usually >130 mm Hg, and target organ damage. Benign EHT is less severe than malignant EHT, without target organ damage and is usually symptomless. If the sub-category of EHT is not specified, then it is coded as unspecified EHT (Medical Terminology Dictionary, 2007; U.S. National Library of Medicine and National Institute of Health, 2007).

### *Measures*

The main outcome measures included the chief reason for ED visit (complaint) and secondary diagnoses. These variables were originally assigned based on the ICD-9 codes. Each record may have one primary diagnosis and up to nine secondary diagnoses. Two new variables relating to the symptoms of hypertension were created. Twelve related symptoms based on the ICD-9 codes included 1) dizziness, 2) fatigue, 3) headache, 4) chest pain, 5) elevated blood pressure 6) nosebleed, 7) tachycardia, 8) heart palpitations 9) unspecified, 10) blood in urine, 11) blurred vision, and 12) others. These symptoms were collapsed into a dichotomous variable as having one or more of the eleven symptoms (i.e., items 1 through 11 above) related to

hypertension versus none of the symptoms or others (i.e., item 12). In addition, the reasons for ED visit was dichotomized as reasons related to the primary diagnosis (i.e., yes if malignant, benign, and unspecified EHT) versus reasons unrelated to the primary diagnosis or no. A new variable that combined the reasons and symptom was then created; if the reasons or symptoms were related to the primary diagnosis, it was coded as yes or 1 and records with reasons or symptoms not related to the primary diagnosis was coded as no or 2.

Socio-demographic variables included in the study were age, sex, race/ethnicity, and insurance status. Age groups were created from the original age variable as those < 25, 25-44, 45-64, 65-74, 75-84, and ≥ 85 years. The original race/ethnicity code was categorized into four groups: 1) Blacks or African Americans, 2) non-Hispanic Whites, 3) Hispanics, and 4) others which included American Indians/Alaskan Natives, and Asians or Pacific Islanders. Insurance status was based on the original principal payer variable that contained 16 categories. These categories were collapsed into 5 categories: 1) Commercial [Health Maintenance Organization (HMO) and Preferred Provider Organization (PPO)], 2) Federal (Medicare, Civilian Health and Medical Program of the Uniformed Services or Champus, and Veterans Administration or VA), 3) State (Medicaid, Workers Compensation, and other state/local government), 4) Charity and underinsured, and 5) others or uninsured (included those who did not have any of the above health insurance). The original discharge status included 10 categories which were collapsed into 3 categories: 1) discharged home (i.e., those discharged to home care or a home healthcare organization or discharged home on IV medications), 2) expired, and 3) discharged to another facility (i.e., those transferred to a short term general hospital, to a skilled nursing facility, to an intermediate care facility, to another sub-category of institution or facility, and those that left against medical advice). Length of hospital stay was recoded as a categorical variable: less than one day versus one or more days.

### *Data analysis*

Data analysis was performed using SPSS version 14 (Chicago IL). Records with EHT were stratified as benign, malignant, and unspecified groups. Linear regression models were used to assess variations in hospital length of stay and age. Statistical tests (chi-square and F tests) were used to evaluate differences in characteristics among EHT groups.

## Results

Of the 5,546,999 ED records from the most recently updated 2005 AHCA data, 0.62% or 34,625

records had primary diagnosis of EHT. The mean and standard error (SE) of age were 59.3 ( $\pm 0.68$ ) years, 61.7 ( $\pm 0.58$ ) years, and 57.6 ( $\pm 0.09$ ) years for patients with malignant, benign, and unspecified EHT, respectively (Data not shown). About 33,346 (96.3%) records had unspecified HT, while only 701 (2.0%) of records had benign and 578 (1.7%) had malignant EHT (Table 1). Patients were

more likely to be female (60.1%), White (55.9%), discharged home (95.5%), and have a hospital stay <1 day (83.6%). About 38% had Medicare or other Federal health insurance; 24.1% were underinsured.

There were no differences in gender distribution by three type of EHT (Table 2). There were statistically significant differences in race/ethnicity, age group, discharge status, insurance status, and length of stay between three types of EHT ( $p \leq .01$ ). Most patients were White, female, and 45-64 years of age regardless of types of EHT. Less than one-third of patients had commercial health insurance. Over 20% of patients with malignant and unspecified EHT were underinsured whereas 8% of patients with benign EHT were underinsured. There were only two deaths among patients with unspecified EHT. Length of stay of less than 1 day was more common among patients with benign EHT (98.3%) than unspecified (83.5%) or malignant (69.0%) EHT. More patients with malignant (32.0%) EHT tended to stay longer during ED visits compared with unspecified (16.5%) and benign (1.7%) EHT patients.

The most frequent secondary diagnosis among patients with malignant (12.6%) and unspecified (10.7%) EHT was diabetes without complications (Table 3). However, for benign EHT patients, the most frequent secondary diagnosis was abnormal lipid metabolism or lipid disorder (20.0%). Regardless of EHT type, diabetes and lipid metabolism disorders were the most frequent secondary diagnoses among patients admitted to the ED. When identifying the most frequent reason for visiting the ED with hypertension-related symptom, headache was found to be the most common among patients with malignant (6.6%), benign (0.4%), and unspecified (8.8%) EHT (Table 4). Interestingly, elevated blood pressure without prior diagnosis of hypertension (ICD-9 code 796.8) was also a frequent symptom among malignant (4.3%), benign (0.4%) and unspecified (5.7%) EHT.

In assessing the congruence between principal diagnosis of EHT types and patients' reason for ED visit, only 40% of malignant and 65.4% of unspecified EHT patients were able to identify their principal diagnosis EHT types correctly ( $p < .01$ ) (Table 5). Most patients with benign (95.8%) EHT correctly identified their principal diagnosis as benign EHT. Thus, 60.0% patients with malignant EHT and 34.6% of patients with unspecified EHT as principal diagnoses were inconsistent with their reasons for ED visit diagnoses. Moreover, malignant (74.6%) compared with unspecified (76.6%) benign (98.7%) EHT patients reported symptoms that were not related to EHT during their ED visits.

**Table 1. Emergency Department (ED) Records with Essential Hypertension in Florida, 2005 (n = 34,625)**

Essential Hypertension types & (ICD-9 code)	n	%
Malignant (401.0)	578	1.7
Benign (401.1)	701	2.0
Unspecified (401.9)	33346	96.3
<b>Sex<sup>#</sup></b>		
Male	13812	39.9
Female	20812	60.1
<b>Race/Ethnicity<sup>###</sup></b>		
Black/African American	10644	31.4
White	18960	55.9
Hispanic	4040	11.9
Others	244	0.8
<b>Age (years)</b>		
<25	627	1.8
25-44	7801	22.5
45-64	13572	39.2
65-74	5619	16.2
75-84	5086	14.7
$\geq 85$	1920	5.6
<b>Discharge Status</b>		
Discharged to Home	32899	95.5
Discharged to another care facility	1724	4.5
Expired	2	0
<b>Insurance Status<sup>###</sup></b>		
Commercial: HMO & PPO	9900	28.6
Federal: Medicare etc	13162	38.0
State: Medicaid etc	3154	9.1
Underinsured & Charity	8342	24.1
Uninsured	56	0.2
<b>Insurance Status<sup>###</sup></b>		
Commercial: HMO & PPO	9900	28.6
Federal: Medicare etc	13162	38.0
State: Medicaid etc	3154	9.1
Underinsured & Charity	8342	24.1
Uninsured	56	0.2
<b>Length of Stay</b>		
< 1 day	28938	83.6
$\geq 1$ day	5687	16.4

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**Table 2: Variations in Patient Characteristics by Types of Essential Hypertension: in Florida, 2005 (n = 34,625)**  
**Essential Hypertension Types**

	<b>Malignant (n= 578)</b>	<b>Benign (n=701)</b>	<b>Unspecified (n=33,346)</b>		
	<b>n ( %)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>X<sup>2</sup></b>	<b>P</b>
<b>Sex<sup>#</sup></b>				4.749 <sup>a</sup>	ns
Male	208 (36.0)	293 (41.8)	13311 (39.9)		
Female	370 (64.0)	408 (58.2)	20034 (60.1)		
<b>Race/Ethnicity<sup>##</sup></b>				302.584 <sup>b</sup>	**
Black/African American	139 (24.91)	85 (12.3)	10420 (31.9)		
White	355 (63.62)	603 (87.0)	18002 (55.2)		
Hispanic	63 (11.3)	4 (0.6)	3973 (12.2)		
Others	1 (0.2)	1 (0.1)	242 (0.7)		
<b>Age (years)</b>				102.889 <sup>c</sup>	**
<25	3 (0.5)	9 (1.3)	615 (1.8)		
25-44	117 (20.2)	99 (14.1)	7585 (22.8)		
45-64	235 (40.7)	244 (34.8)	13093 (39.3)		
65-74	102 (17.7)	196 (28.0)	5321 (16.0)		
75-84	82 (14.2)	122 (17.4)	4882 (14.6)		
≥85	39 (06.7)	31 (4.4)	1850 (5.5)		
<b>Discharge Status</b>				31.408 <sup>d</sup>	**
Discharged to Home	549 (95.0)	698 (99.6)	31652 (94.9)		
Discharged to another care facility	29 (5.0)	3 (0.4)	1692 (5.1)		
Expired	0 (0.0)	0 (0.0)	2 (0.0)		
<b>Insurance Status<sup>###</sup></b>				154.852 <sup>e</sup>	**
Commercial: HMO & PPO	176 (30.4)	190 (27.1)	9534 (28.6)		
Federal: Medicare etc	240 (41.5)	399 (56.9)	12523 (37.6)		
State: Medicaid etc	41 (7.1)	55 (7.9)	3058 (9.2)		
Underinsured & Charity	120 (20.8)	57 (8.1)	8165 (24.5)		
Uninsured	1 (0.2)	0 (0.0)	55 (0.1)		
<b>Length of Stay</b>				212.821 <sup>a</sup>	**
< 1 day	393 (68.0)	689 (98.3)	27856 (83.5)		
≥ 1 day	185 (32.0)	12 (1.7)	5490 (16.5)		

# missing = 1 ## missing= 737 ### missing =11  
<sup>a</sup> 2 degrees of freedom (df); <sup>b</sup> 6 df; <sup>c</sup> 10 df; <sup>d</sup> 4 df; <sup>e</sup> 8 df  
 ns = not significant; \* = p ≤ .05; \*\* = p ≤ .01

**Table 3: The most frequent Secondary Diagnoses by types of Essential Hypertension in Florida, 2005**

Essential Hypertension Types						
Malignant (n= 578)		Benign (n=701)		Unspecified (n=33,346)		
Rank <sup>a</sup>	Disease & (ICD-9)	n (%)	Disease & (ICD-9)	n (%)	Disease & (ICD-9)	n (%)
1	Diabetes without complications (250.00)	73 (12.6)	Metabolism/lipid disorder (272.4)	142 (20.0)	Diabetes without complications (250.00)	3569 (10.7)
2	Hypercholesterolemia (272.0)	29 (5.1)	Diabetes without complications (250.00)	112 (16.0)	Hypercholesterolemia (272.0)	1011 (3.0)
3	Metabolism/lipid disorder (272.4)	29 (5.1)	Hypercholesterolemia (272.0)	87 (12.4)	Metabolism/lipid disorder (272.4)	595 (1.8)
4	Hypokalemia (276.8)	23 (4.0)	Obesity (278.0)	52 (7.5)	Hypokalemia (276.8)	565 (1.7)
5	Obesity (278.0)	10 (1.7)	Anemia (285.9)	26 (3.7)	Disorder of the urethra or urinary tract (599.0)	511 (1.5)

<sup>a</sup>Rank is based on frequency of diseases of secondary diagnoses. An individual record may have up to nine secondary diagnoses.

## Discussion

Comorbidities among individuals with EHT are understudied, possibly due to investigators using the presence of comorbidities as an exclusion criterion in studies (Fortin et al., 2006). Nevertheless, comorbidities are high in many populations such as the elderly and hypertensive adults (Wang et al., 2005; Fortin et al., 2006; Fillenbaum et al., 2000). For example, Wang et al. (2005) indicated that at least 60% of the elderly population has multiple chronic conditions. Conditions often associated with HT in the general population include those related to cardiovascular risk, such as diabetes, obesity, and dyslipidemia (Majernick et al., 2004; Fortin et al., 2006; Fillenbaum et al., 2000; Xu & Ragain, 2005; Nothwehr & Perkins, 2002). Due to the scarcity of studies relating to EHT-related comorbidities among ED patients, consistency of the findings with the current study cannot be evaluated.

The findings from this study indicated that sub-categories or types of EHT varied significantly by race and ethnicity, age group, discharge status, insurance status, and length of stay. Furthermore, frequencies of comorbidities varied by types of EHT. Diabetes was the most common secondary diagnosis in this study. It is plausible that patients with diabetes have greater levels of uncontrolled HBP leading to an

ED visit. This finding is consistent with a study in which greater odds for uncontrolled HBP was found among ED patients with diabetes (Trioli et al., 2004). In contrast, heart failure, a risk factor for ED visit among hypertensive individuals, was not one of the most common secondary diagnoses in Florida ED patients (Tisdale et al., 2004). It is likely that patients with heart failure in the current study were classified as having secondary HT and would not be included under primary or essential HT classification code. Prevalence of other co-existing conditions also differed by types of EHT. For instance, disorder of the urethra tract was common among patients with unspecified EHT while anemia was common among patients with benign EHT. Interestingly, Fortin et al. (2006) also found anemia to be a frequent diagnosis in about 10% of the non-hospitalized population with HT

In terms of symptoms, headache was the most common complaint by patients with all three types of EHT. Previous studies also have noted headache as a common complaint among ED patients (Marco et al., 2007; Gaini et al., 2004; Zampaglione et al., 1996; Chiang & Jamshani., 1998). Along the same line, the most common symptoms reported in this study were also noted frequently in previous studies among ED patients with elevated BP (Preston et al., 1999;

Karras et al., 2005; Zampaglione et al., 1996). The symptomatology results also indicated that many hypertensive patients in this study were unaware that they had HT since they had elevated BP without previous diagnosis of HT as their reason for ED visit, particularly among patients with malignant EHT. This finding is surprising because diagnosis with malignant EHT implies complications due to elevated BP. Thus, it can be inferred that these patients did not receive the aggressive treatment that patients with malignant EHT would and should normally receive. It is also possible that their EHT condition was not diagnosed early enough or that a non-specific symptom such as headache was ignored during their visits to health care professionals. Furthermore, although HT has been termed “the silent killer” because of its lack of noticeable signs or symptoms, this study revealed that about one-fourth of patients with malignant or unspecified EHT reported HT related symptoms (e.g. headache, chest pain, fatigue) and those symptoms most frequent among EHT could be considered warning signs of elevated BP. This finding is consistent with a previous study where 26% of patients with elevated BP presented symptoms such as chest pain, shortness of breath, headache, and nosebleed (Karras et al., 2005).

Furthermore, patients with malignant EHT were less likely to have agreement between their primary diagnosis and their reason for ED visit. However, a higher percent of HT related symptoms was reported by patients with malignant EHT. These findings implied that individuals with malignant EHT may not only be more likely to have comorbidities and uncontrolled HT, but also lack knowledge about HT. This finding was supported by a study where lack of high BP knowledge was associated with poor BP control among ambulatory HT patients (Knight et al., 2001). Not surprisingly, patients with malignant EHT were more likely to stay more than one day during ED visits than patients with benign or unspecified EHT. Differences observed between malignant and benign EHT in this study could partially be due a greater percentage of minorities (Blacks and Hispanics) representing with malignant EHT rather than benign EHT. For example, incidence of malignant HT has been shown higher among Blacks than Whites of hospitalized patients in the Netherlands (van den Born et al., 2006). Similarly, non-Hispanic Blacks and Hispanics have shown greater levels of uncontrolled HBP compared with non-Hispanic Whites in the general population (Hajjar & Kotchen, 2003). Among ED patients, African Americans have also been found to have greater BP levels compared with other ethnic groups (Karras et al., 2005).

To our knowledge, this is the first study to explore comorbidities among ED-admitted patients with EHT in Florida. Strengths of this study were a large sample size and the validity of the data on comorbidities was greater compared to other studies relying on self-reported disease information. The accuracy of diagnoses in this study was enhanced by using the standard ICD-9 codes used by trained health personnel.

Several limitations of this cross-sectional study should be noted. Primarily, there is the limitation in access to other patient characteristics such as measured BP value at ED admission, family history of other chronic conditions, length or chronicity of comorbid conditions, income, social support, use of antihypertensive medications, lifestyle habits (e.g. dietary and exercise), and frequency of ED visits. This study only included records with primary diagnosis of EHT, which are based on the primary service received in the ED. Thus, individuals with EHT that visited the ED primarily for reasons other than EHT were excluded. Since personal identifiers were not available, an individual that was admitted to ED more than once could not be identified. The patient population was restricted to those visited ED only in 2005. Thus, patients with EHT who visited outpatient departments or inpatient acute-care hospitals were not included.

## **Conclusion**

In summary, the most common comorbidities among ED patients with EHT were diabetes and metabolism lipid disorder, particularly among patients with malignant and unspecified EHT. Symptoms and signs such as headache and elevated BP were the most common and were mainly reported by patients with malignant or unspecified EHT. Patients with malignant EHT were more likely than patients with unspecified or benign EHT to be black or African American and provided a reason for ED visit inconsistent with the primary diagnosis type.

Previous studies have shown an association of comorbidity with uncontrolled HBP among HT patients (Trioli et al., 2004; Preston et al., 1999; Shayne et al., 2003; Karras et al., 2005). However, it is not known if the ED patients with co-existing conditions and symptoms related to EHT in this study were unaware of or had uncontrolled HBP. Nevertheless, improved HT management and health education of HT related topics may be beneficial to the ED patients in Florida. Future studies should evaluate differences in presence of these conditions and symptoms by various patient characteristics among hypertensive patients, particularly differences by race/ethnicity.

## Implications

The findings from this study have the important implications for both medical and public health professionals interested in the prevention and control of hypertension and related complications. Few studies have focused on comorbidities and symptoms among patients admitted to emergency departments (ED) with EHT, yet identifying comorbidities may influence the management of hypertension. Based on our results, conditions most likely to coexist with

EHT among Florida patients included diabetes and lipid metabolism disorder. Conceivably, management of EHT may be improved if these coexisting chronic diseases are detected and controlled early. Prevention programs and interventions that educate individuals about symptoms associated with hypertension may not only increase awareness of high blood pressure, but may also increase awareness of when management is not being effective among diagnosed hypertensives.

**Table 4: The most frequent Reason (patients' complaint) for ED by types of Essential Hypertension in Florida, 2005**

Essential Hypertension Types								
Malignant (n= 578)			Benign (n=701)			Unspecified (n=33,346)		
Rank <sup>a</sup>	Reason & (ICD-9)	n (%)	Reason & (ICD-9)	N (%)	Reason & (ICD-9)	n (%)		
1	Headache (780.0)	38 (6.6)	Headache (780.0)	3 (0.4)	Headache (780.0)	2954 (8.8)		
2	Chest pain (786.50)	36 (6.2)	Elevated BP without hypertension (796.2)	3 (0.4)	Elevated BP without hypertension (796.2)	1907 (5.7)		
3	Dizziness (780.4)	26 (4.5)	Dizziness (780.4)	2 (0.3)	Chest pain (786.50)	628 (1.8)		
4	Elevated BP without hypertension (796.2)	25 (4.3)	Chest pain (786.50)	1 (0.1)	Fatigue (780.79)	449 (1.3)		
5	Fatigue (780.79)	10 (1.7)	NA <sup>b</sup>		Palpitations (785.1)	156 (0.4)		

<sup>a</sup>Rank is based on frequency of a primary reason ICD-9 code. <sup>b</sup> Only 4 symptoms related to Benign EHT. Thus, 5<sup>th</sup> rank symptom is NA.

**Table 5: Comparison between Principal Diagnosis and Patients' Reason for Emergency Department (ED) Visit**

Principal Diagnosis: Essential Hypertension (EHT) Types					
	Malignant (n= 578)	Benign (n=701)	Unspecified (n=33346)		
	n (%)	n (%)	N (%)	X <sup>2</sup>	p
<b>Reason for ED visit based on EHT Type</b>					
401.0: Malignant	231 (40.0)	0 (0)	5 (0.0)	46252.76 <sup>a</sup>	**
401.1: Benign	5 (0.86)	672 (95.8)	3 (0.0)		
401.9: Unspecified	120 (20.76)	13 (1.9)	21786 (65.4)		
Other	222 (38.38)	16 (2.3)	11552 (34.6)		
<b>Reason for ED visit based on symptoms related to EHT</b>					
Yes	147 (25.4)	9 (1.3)	7814 (23.4)	192.02 <sup>b</sup>	**
No	431 (74.6)	692 (98.7)	25532 (76.6)		
<b>Reason for ED visit based on types of or symptoms related to EHT</b>					
Yes	503 (87.0)	694 (99.0)	29608 (88.8)	75.195 <sup>b</sup>	**
No	75 (13.0)	7 (1.0)	3738 (11.20)		

<sup>a</sup>6 degrees of freedom (df); <sup>b</sup> 2 df ns = not significant; \* = p <0.05; \*\* = p <0.01

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