Hypertension

Hypertension is high blood pressure, generally defined as systolic/diastolic blood pressure measurements of equal to or greater than 140/90 mm Hg. It is the 13th leading cause of death nationwide[232] and was the primary cause of death for 42 Kansas Citians in 2004, with 37 (88%) of the deaths occurring among residents of the Jackson County portion of Kansas City.

Economically, hypertension is 5th among the top 15 health care problems accounting for the rise in medical care costs in this country.[233] It is responsible for an estimated 17.2 million visits to office-based physicians each year[234] and for 1.2 million visits to hospital outpatient departments.[235] Hospitalizations for hypertension are more prevalent among blacks and Hispanics.[236]

Hypertension is a major risk factor for many diseases, such as heart disease, stroke, damage to blood vessels, aortic dissection, kidney damage and failure, and vision loss. In 2001 in Missouri, the prevalence of chronic kidney failure caused by hypertension was 367 per 1 million residents.[237] The prevalence had increased 87% over that in 1990. In Kansas the prevalence rate was lower, 182, and had only increased 49% since 1990.

Blood pressure itself can be affected by many factors including genetics, volume of water in the body, salt content of the body, kidney function, and blood vessel health. “Essential” hypertension comprises over 95% of all high blood pressure cases and has no identifiable cause. “Secondary” hypertension is high blood pressure caused by another disorders such as tumors, kidney disorders, medications, oral contraceptives, etc. A 12 to 13 point reduction in blood pressure among people with hypertension can

[232] Hoyert DL et al. 2005. Deaths: preliminary data for 2003. National Center for Health Statistics, *Natl Vital Stat Reports* 53(15). 48 p.

[233] Thorpe KE et al. 2004. Which medical conditions account for the rise in health care spending? *Health Affairs* W4:437-445.

[234] Woodwell DA, Cherry DK. 2004. National ambulatory medical care survey: 2002 summary. National Center for Health Statistics, *Advance Data Vital Health Stat* 346. 44 p.

[235] Hing E, Middleton K. 2004. National hospital ambulatory medical care survey: 2002 outpatient summary. National Center for Health Statistics, *Advance Data Vital Health Stat*: 345. 35 p.

[236] Laditka JN, Laditka SB. 2006. Race, ethnicity and hospitalization for six chronic ambulatory care sensitive conditions in the USA. *Ethnicity Health* 11:247-263.

[237] Pirtle CJ et al. 2004. State-specific trends in chronic kidney failure – United States, 1990-2001. *MMWR* 53:918-920.

reduce heart attacks by 21%, strokes by 37%, and total cardiovascular disease deaths by 25%.[238]

Between 2000 and 2004, 203 Kansas City residents died from essential hypertension. The age-adjusted rate of 9.8 per 100,000 was 53% higher than the statewide death rate of 6.4 for this cause. Eighty-seven percent of the deaths occurred among persons ≥65 y of age. Overall, males had a lower age-adjusted death rate than females, 9.1 and 9.9, respectively. Black women had the highest age-adjusted death rate (21.8) followed by black men (19.3), white women (6.0), and white males (5.9). The black:white disparity ratios for death due to essential hypertension were 3.6:1 for females and 3.3:1 for males.

Usually, persons with hypertension have no symptoms, but very high and dangerously high (termed malignant) hypertension generally are associated with symptoms such as severe headache, confusion, tiredness, vision changes, etc. Hypertension is controllable with treatment, requiring life long monitoring, and the treatment may require adjustments periodically. Although effective therapy has been available for more than 50 years, it is estimated that 70% of persons with high blood pressure do not have it under control.

Data collected by the 2003 National Ambulatory Medical Care Survey found that blood pressure was measured during 52.4% of patient visits.[239] The overall means for systolic and diastolic blood pressures were 125.9 and 75.6 mmHg, respectively. Persons with essential hypertension had systolic and diastolic blood pressures of 140.1 and 81.2 mmHg, respectively. Persons with high blood pressure (≥140 mmHg systolic or ≥90 mmHg diastolic) had more ambulatory care visits if they were 45-64 y old than those who were 25-44 y old and those ≥65 y of age.

In 2004, the Kansas City Health Department commissioned a telephone health assessment survey of residents the results of which reported that 29.5% of respondents suffered from hypertension.[240] This was somewhat lower than the 34.4% prevalence of hypertension among Kansas City residents found

[238] Centers for Disease Control and Prevention. 2004. The burden of chronic diseases and their risk factors. National and state perspectives. 185 p. www.cdc.gov/nccdphp.

[239] Hing E et al 2005. National Ambulatory Medical Care Survey: 2003 summary. *Advance Data Vital Health Stat* 365: 48 p. www.cdc.gov/nchs.

[240] Kansas City Health Department. 2004. 2004 Health Assessment Survey. www.kcmo.org/health.

by the state's 2003 Behavioral Risk Factor Surveillance System.

Nationally, the prevalence of hypertension is 31.3%[241] and 22% of adults had been told two times or more by their health care provider that were hypertensive.[242] The prevalence of hypertension in the population rises with age and is higher among women than men. Among US residents ≥55 y old, the prevalence is highest among blacks (55.9%), lowest among Asians (31.8%), and similar for whites (36.0%) and Hispanics (36.9%).[243]

Hypertension also occurs in adolescents, with higher prevalences among the overweight and obese. A three-state study found 12.8% of 8th graders had prehypertension and 13.8% were hypertensive.[244] In that same study, 13.6% of overweight students had prehypertension and 15.9% were hypertensive and among the obese 19.8% were prehypertensive and 24.6% were hypertensive. Among students of normal body mass index, only 8.6% were considered prehypertensive and 6.9% as hypertensive. In Kansas City, the Kansas City University of Medicine and Biosciences (KCUMB) has been screening school children in various school districts for a variety of health conditions, including hypertension. As of this writing, KCUMB is in the process of analyzing the findings to date, but has not issued a report to the community.

The Yr 2010 national objectives for hypertension include reducing the proportion of adults with high blood pressure to 16% (baseline 28%), increasing the proportion of adults who are taking action to control it to 95% (baseline 82%), and increasing the proportion of adults with controlled high blood pressure to 50% (baseline 18%). Unfortunately, the National Health and Nutrition Examination Survey (NHANES) data show a rise in hypertension among adults from 28.9% in 1988-1994 to the more recent data and this increase was associated with a corresponding rise in obesity in the population. In addition, the NHANES data showed that only 63.4% of persons with high blood pressure were aware

[241] Fields LE et al. 2004. The burden of adult hypertension in the United States 1999-2000, a rising tide. *Hypertension* 44:398-404.

[242] Centers for Disease Control and Prevention. 2006. Summary health statistics for US adults: National Health Interview Survey, 2004. National Center for Health Statistics. *Vital and Health Statistics*, series 10 number 228, 282 p. www.cdc.gov/nchs.

[243] Schoeborn CA et al. 2006. Health characteristics of adults 55 years of age and over: United States, 2000-2003. National Center for Health Statistics. *Advance Data Vital Health Stat:* 370, 32p. www.cdc.gov/nchs.

[244] Jago R et al. 2006. Prevalence of abnormal lipid and blood pressure values among an ethnically diverse population of eighth grade adolescents and screening implications. *Pediatrics* 1117:2065-2073.

of their condition and that only 29.3% of hypertensives had their blood pressure under control.[245] The proportions of persons who were aware of their hypertension as well as those who had it under control were considerably lower among Hispanics than whites or blacks. The proportion of hypertensive adults who had their blood pressure under control varied substantially by age group: 17.6% for those 20-39 y of age, 40.5% for 40-59 y olds, and 31.4% for those ≥60 y of age. Among Hispanics immigrants, the degree of acculturation into the community is related to hypertension.[246] Those with a low degree of acculturation have a lower prevalence of hypertension.

In addition to high blood pressure, the 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, from the National Institutes of Health's National Heart, Lung, and Blood Institute, identified a new classification, prehypertension, as a systolic blood pressure between 120 and 139 mm Hg, and defined residual hypertension as continuing to have a systolic pressure of 140 mm Hg or higher despite treatment. According to the new recommendations, beginning at a blood pressure of 115/75 mm Hg, the risk of cardiovascular disease doubles with each increment of 20/10 mm Hg.

Prehypertension is considered a significant health problem[247] [248] that requires treatment with diet, exercise and smoking cessation.[249] It is associated with increased risk for myocardial infarction and coronary artery disease, but not stroke.[250] Using this new classification, 60% of the adult population has either prehypertension (31%) or hypertension (29%) based on NHANES data.[251] [252] The age-adjusted prevalence of prehypertension was greater among men than women, 39.0% and 23.1%,

[245] Glover MJ et al. 2005. Racial/ethnic disparities in prevalence, treatment, and control of hypertension – United States, 1999-2002. *MMWR* 54:7-9.

[246] Vaeth P, Willett DL.. 2005. Level of acculturation and hypertension among Dallas County Hispanics: findings from the Dallas Heart Study. *Ann Epidemiol* 15:373-380.

[247] Russell LB et al. 2004. Effects of prehypertension on admissions and deaths. A simulation. *Arch Intern Med* 164:2119-2124.

[248] Winegarden CR. 2005. From "prehypertension" to hypertension? Additional evidence. *Ann Epidemiol* 15:720-725.

[249] Wang Y, Wang Q. 2004. The prevalence of prehypertension and hypertension among US adults according to the New Joint National Committee Guidelines. *Arch Intern Med* 164:2126-2134.

[250] Qureshi AI et al. 2005. Is prehypertension a risk factor for cardiovascular diseases. *Stroke* 36:1859-1863.

[251] Greenlund KJ et al. 2004. Prevalence of heart disease and stroke risk factors in persons with prehypertension in the United States, 1999-2000. *Arch Intern Med* 164:2113-2118.

[252] Qureshi AI et al. 2005. Prevalence and trends of prehypertension and hypertension in United States: National Health and Nutrition Examination Surveys 1976 to 2000. *Med Sci Monitor* 11(9):CR 403-409.:

respectively. Blacks, 20-39 y old, had a higher prevalence of prehypertension (37.4%) than whites (32.2%) and Hispanics (30.9%), but their prevalence was lower at older ages because of a higher prevalence of hypertension. Persons with prehypertension were 1.65 times more likely to have at least 1 other adverse risk factor for heart disease and stroke than those with normal blood pressure.