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The Prevalence of Stroke, Hypertension and Diabetes in Jackson Heart Study Cohort from 2000-2013: A Comparative Analysis

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Abstract

Stroke is the fifth leading cause of death and is a type of cardiovascular disease (CVD) that greatly affects the African American community. Stroke, hypertension, atherosclerosis, heart disease, and many others fall in the category of CVD. Stroke is also the leading cause of disability which leads in being one of the biggest expenditures in healthcare. Preventative methods for stroke are limited to individual management based on factors such as, genetics, family history, high blood pressure, smoking, etc. Effective management of these issues can ensure a decent quality of life for those who suffer from such illnesses. We hypothesize that male patients in the Jackson Heart Study cohort will show a significant increase in stroke between the ages of 35-50 as compared to women which would be like current statistics. With analyzed datasets collected from the Jackson Heart Study, we did a comparative analysis of men to women by identifying the percentages of people in the heart study who had strokes and risk factors for stroke. The two risk factors we analyzed were diabetes and hypertension. We used Pearson Correlation and Independent t test, to identify p values.

Introduction

Stroke According to the American Stroke Association, a stroke kills about one in every 20 people, making stroke the 5th leading cause of death in the nation. Stroke is also the leading cause 2 of long-term disabilities. Stroke outlays the United States an estimated $34 billion each year in expenditures [1]. With so many individuals affected by stroke, it then begins to affect the economy directly and indirectly. Those direct costs include hospitals, nursing homes, medications, physical therapy, and other healthcare factors. Indirect factors involve loss of productivity due to morbidity and mortality [2]. Stroke is defined by a blockage of blood flow to the brain by way of obstruction of the vessels. There are two types for stroke. Ischemic stroke occurs when there is a blockage in the blood vessel that restricts the blood flow. Hemorrhagic strokes occur when the blood vessel ruptures and bleeds into surrounding tissues [American Stroke Association (ASA), (n.d.)]. In 2005, approximately 5.8 million people 20 years and older suffered from a stroke. There are many risk factors for stroke. Race plays a major role in the predisposition in risk factors for stroke. African Americans are more susceptible to stroke than their Caucasian counterparts. Women are more at risk for stroke than men after menopause. Risk factors associated with stroke are genetic factors, hypertension, smoking, alcohol consumption, and family history. Currently, there are three therapy tiers for stroke: prevention, therapy straight away after the stroke, and post-stroke rehabilitation. Therapies to forestall the first or a recurrent stroke are created with the aid of treating an individual's main risk factors for stroke, such as hypertension, atrial fibrillation, and diabetes [3]. Acute stroke treatment options are used to cease a stroke whilst it happens by way of rapidly dissolving or getting rid of the blood clot and continuing blood flow or stopping excessive bleeding. Post-stroke rehabilitation helps individuals overcome disabilities that result from stroke damage. Medication or drug remedy is the most common remedy for stroke. The most popular classes of drugs used to prevent or treat stroke are antithrombotic and capsules that destroy or dissolve blood clots, called thrombolytic [4].

The focus of this study is stroke and two of its risk factors, hypertension and diabetes in Jackson, Mississippi, and surrounding areas. The Jackson Heart Study is a foundation organized with a goal to create innovate ways to combat CVD and to educate people on reasons for the greater prevalence of CVD in African Americans [Research Overview. (n.d.)]. The Jackson Heart Study is a collection of medical data and family history from about 5,000 African American in the areas described earlier.

The purpose of this study is to compare stroke and its risk factors; hypertension and diabetes, between males and females in Jackson Heart Study Cohort between the years of 2000-2011. In this study, we hypothesized men be more prevalent to stroke and its risk factors; hypertension and diabetes compared to Mississippi Statistics. The specific aims for this research include: 1. Identify correlation of differences between women and men with these risk factors based on the time frame of the study. 2. Compare the relationship between women and men with stroke, hypertension and diabetes based on age.

Materials and Methods

The Jackson Heart Study is a prospective, community-based, observational study designed to investigate risk factors for cardiovascular disease in blacks. Protocol for data collection follows protocol as stated by Carpenter et al., [5]. Participants completed 3 study visits: examination 1 between 2000 and 2003, examination 2 between 2004 and 2007, and examination 3 between 2008 and 2011. Reading centers for electrocardiograms, echocardiograms, carotid ultra-sonograms, pulmonary function tests, and ambulatory blood pressure monitoring provide training for data accrual, quality assurance assessments, and specialized measurements for research objectives. Laboratories adhering to well established quality assurance programs provide blood and urine analyses, as well as storage of specimens for future assays. A new Coordinating Center was created to perform functions analogous to those of coordinating centers for multisite studies, including protocol development, data management, statistical analyses, and operational support for the study. An established coordinating center serves as a resource to the JHS Coordinating Center, aiding in preparing procedure manuals and data collection forms. This group also designed and developed the JHS data management system. Information collected during in person visits included medical history, BP, medications, laboratory values, anthropometrics, physical activity, dietary data, and social and environmental risk factors. All participants provided written informed consent, and study protocols were approved by local institutional review boards.

Statistical Analysis

We calculated gender-specific and age specific stroke incidence, hypertension, and diabetic status within the 13-year cohort study and used direct standardization to estimate gender specific age-adjusted incidences and status. Pearson Correlations were used to identify significant between gender and risk factors. Independent test was used to identify significance between age and risk factors. Each test was achieved using SPSS Software to determine significance in data and Microsoft Excel to create visuals representations.

Pearson Correlation Test

Pearson's correlation coefficient is a measure of the strength of the association between the two variables. Independent Sample T-test. The independent-samples t-test compares the means between two unrelated groups on the same continuous, dependent variable.

Results

Comparing the relationship between women and men with stroke, hypertension, and diabetes Each of the following graphs depict the analysis of the data sets from the Jackson Heart study (JHS). The results of our data suggest that men have a higher prevalence of stroke than women in the three cohort groups (Exam 1, 2, and 3) from the ages of 55-64. Nonetheless, women have a higher prevalence of hypertension and diabetes at 55-64. The first three graphs depict data for stroke. (Figure 1) gives a comparison of stroke in the age groups for men and women in Exam 1 which was collected between 2000-2004. This study compares the percentages of men to women. In the age range, under 35, men have a higher incident of stroke than women in the JHS. From the ages of 35-54, there is a significant increase in women stroke case as compared to men. However, there is a reverse in significance in the age group of 55-64. Men greatly exceed women at an older age during this age groups. As compared to the statistics released to the Mississippi Department of Health (MDH), the male population shows a higher prevalence of stoke than women. This is related to hormone levels in women that act as a protector against stroke [Mosco et al, [6]. The following graph is a comparison of the age groups for men and women in (Figure 2) collected from 2005-2008. In the comparison of men to women under 35 years of age, there is a slight increase in women stroke cases over men. From the ages of 35-54, there is a significant increase in women stroke case as compared to men. Subsequentially, there is a reverse in significance in men at the ages of 55-64 (Figure 2). These results suggest that men greatly exceed women at a later age to those results of (Figure 1). 16 (Figure 3) is a comparison of age groups for men and women datasets collected for the years of 2010-2013 were shown in (Figure 3). Like (Figure 2) in the comparison of men to women under 35, there is a slight increase in women stroke cases over men. From the ages of 35-54, there is a significant increase in women stroke case as compared to men. At the ages of 55-64, there is a reverse in significance. These three graphs (Figure 1, 2, and 3) suggest there is a higher prevalence of men stricken with strokes than women. As reported by MDH, 74.2% of men in Mississippi reported to having a stroke to 55.6% of women having stroke. From (Figures 1-3), the data collected from the Jackson Heart Study for individuals with stroke suggest that men have a higher prevalence of stroke.

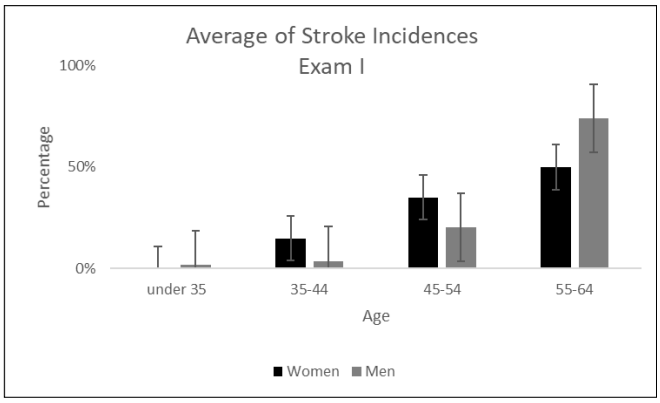

Figure 1: Average Incidence of Stroke Exam I: Men show a significant increase in stroke cases as compared to women at the same age of 55-64. P value=0.0013, 0.002, 0.003 respectively.

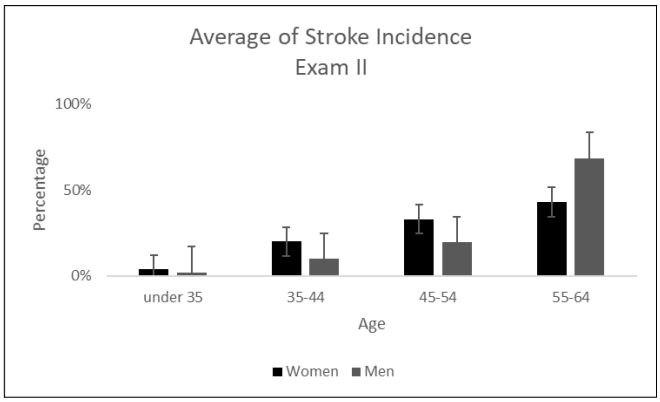

Figure 2: Average Incidence of Stroke Exam II: Women exceeds men from 45-54 in stroke cases, there is a sudden spike in case number for men at the ages 55-64 as in Figure 1. P values:0.0035, .0.0045 respectively

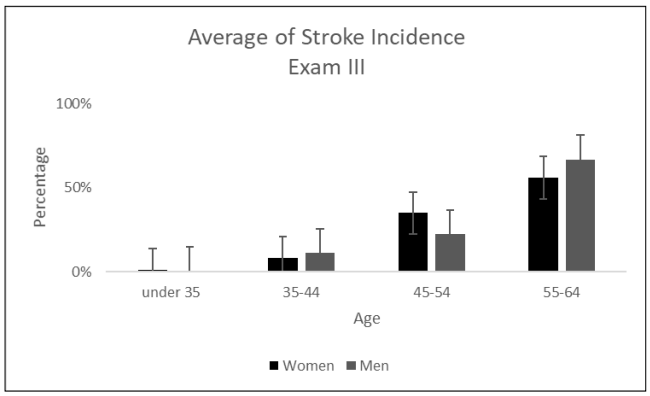

Figure 3: Average Incidence of Stroke Exam III. Women exceeds men from 45-54 in stroke cases, there is a sudden spike in case number for men at the ages 55-64 also seen in Figure 1 and 2. P values= 0.0023, 0.0042 respectively

When looking at the data from the Mississippi Department of Health, it deems our results accurate to overall stroke data in Mississippi. The next set of graphs were developed to visualize datasets from the Jackson Heart Study on hypertension (Figures 4-6). These cohort participants answered on the questionnaire that they were aware of their hypertensive status or had measurements of hyper systolic and/ or diastolic pressure during the medical examination. (Figure 4) is a comparison of age groups for men and women in Exam 1 from the years 2000-2004. In the first comparison of men and women under 35, the percentage of men to women shows about equivalent. From the ages of 35-44, there is a higher percentage of men to women, but the 45-54 age group show no discrepancies.

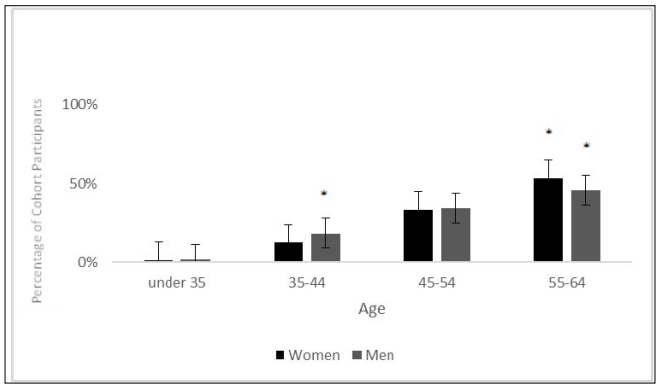

Figure 4: Average of Hypertension Status Exam I This graph shows a trend of cases between men and women being about equal over the year 45-54. There is no visual significant difference, but slight differences in 35-44. There is a sudden increase at ages 55-64 with women over men. P value= .0001, 0.0001, 0.0001.

Lastly, the age group of 55-64, the percentage of women with a hypertensive status was higher than men. (Figure 5) depicts Exam 2 which was datasets collected from the years 2005-2009 in the Jackson Heart Study. The first comparison of men to women under 35 do not have ratio 17 discrepancies from the time frame of (Figure 4), but an increase in number of people with hypertension increased. From the ages of 35-44, there is a slightly higher percentage of men to women. The next group, 45-54, again shows no discrepancies when compared to the cohort in (Figure 4).

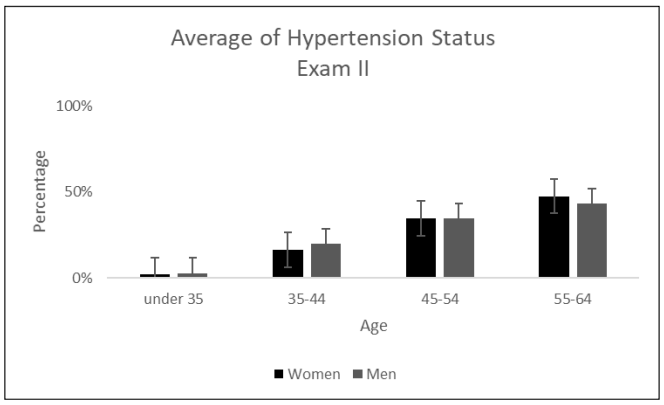

Figure 5: Average of Hypertension Status Exam II. This graph shows a trend of cases between men and women being about equal over the year 45-54. There is no visual significant difference, but slight differences in 35-44. There is a sudden increase at ages 55-64 with women over men. P value: 0.0001, 0.00012.

In the final comparison of men to women in the age group of 55-64, the percentage of women with a hypertensive status was higher than men. The last cohort data set for hypertension is (Figure 6) which was collected by JHS from the year 2010-2013. Data of men and women under the age of 35 shows results with no discrepancies from (Figure 4 and 5). In the age group of 35-44 and 45-54, there is a slightly higher percentage of men to women. Lastly, in the older age group of 55-65, the percentage of women with a hypertensive status was higher than men. Men show a higher prevalence of hypertension from the ages of 35-54 as compared to women because of the relationship between hypertension and BMI. Also, genetically men show a higher occurrence of genetic disorders that cause hypertension such as renal disease [7]. This gives way to cardiovascular diseases. On the other hand, women become more at risk for hypertension during menopausal age because of the significant in hormone change [6]. Because of this hormonal shift, women experience an increase in weight gain and difficult to control blood pressure even with drug therapy [6].

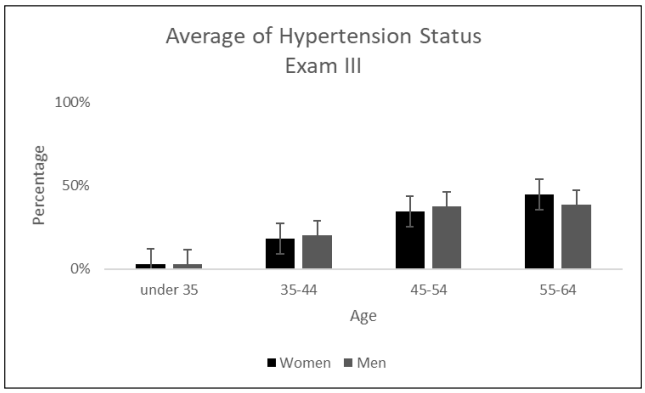

Figure 6: Average of Hypertension Status Exam III: This graph shows a trend of cases between men and women being about equal over the year 45-54. There is no visual significant difference, but slight differences in 35-44. There is a sudden increase at ages 55-64 with women over men. P value: 0.0001, 0.00012

The Mississippi Department of Health suggest that lifestyle plays a big part in the prevalence of these diseases. Many African Americans report not including physical activity into

their lifestyle. This will be discussed more in depth in the discussion. Lastly, men and women from the JHS cohort study was analyzed for diabetes mellitus (DM) (Figures 7-9). This dataset was acquired from individuals in the cohort that stated that they were aware of having diabetes mellitus or had glucose levels measuring above 18 normal during the medical exam. (Figure 7) is a comparison of data take from the year 2000-2004 deemed Exam 1. In Exam 1, men and women under 35 have ration that is equivalent meaning that there is an equal number of men to women in this cohort at the stated age with diabetes. At the ages range of 35-44, there is a slightly higher percentage of men to women who reported to suffer from diabetes. When viewing the age group of 45-54, there is little to no divergences in the ratio between men and women.

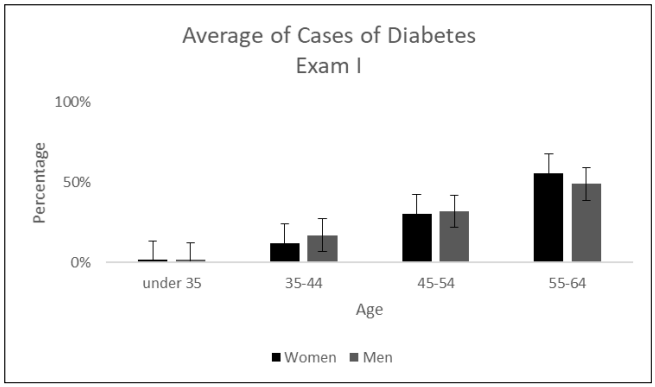

Figure 7: Average Cases of Diabetes Exam I: Women show a significance in the number of diabetic cases than men at the ages of 55-65 as compare to other age groups. The other age groups show men cases being higher than women, except at age 45-54. P values= 0.012, 0.007, 0.009

However, a shift in the ratio of diabetes cases shift in the age group 55-64. In this group, women are seen to have more diabetic cases than men. This leads to the next exam, Exam 2, depicted in (Figure 8). In figure 8, there is a comparison of datasets collected by the JHS from the year 2005-2009. The comparison of men and women under 35 gave results to show that men had a slightly higher number of cases than women. In the next age group, 35-44 again men had a higher number of cases of diabetes than women. The dataset in (Figure 8) concludes with the age group of 55-64. In this group, women show a significant increase of diabetic cases when compared to men at the same age or younger.

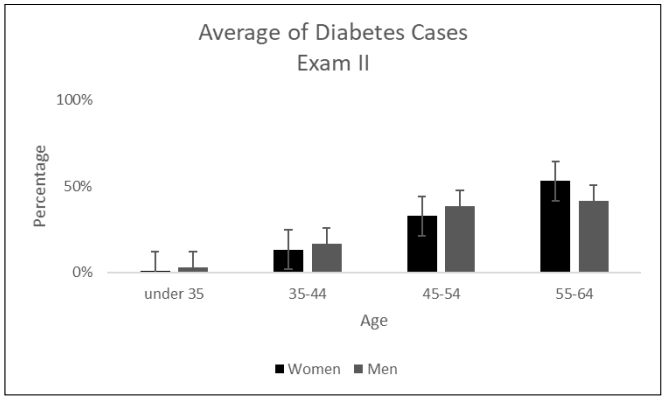

Figure 8: Average Cases of Diabetes Exam II: Women show a significance in the number of diabetic cases than men at the ages of 55-65 as compared to other age groups. The other age groups show men cases being higher than women. P values= 0.012, 0.007, 0.009

The diabetes mellitus data set completes with Exam 3, which was collected by the JHS from the years 2010-2013. Just as in the previous cohort groups under 35, the percentage of men having diabetes was slightly higher than women. This same trend is also seen in the ages 35-44. The age group of 45-44 depicted little discrepancies. Diabetes shows a higher prevalence in women than men at a later age of 55-64 (Figure 9). From these datasets, the suggestion can be made that women are at a higher risk of diabetes than men at a later age.

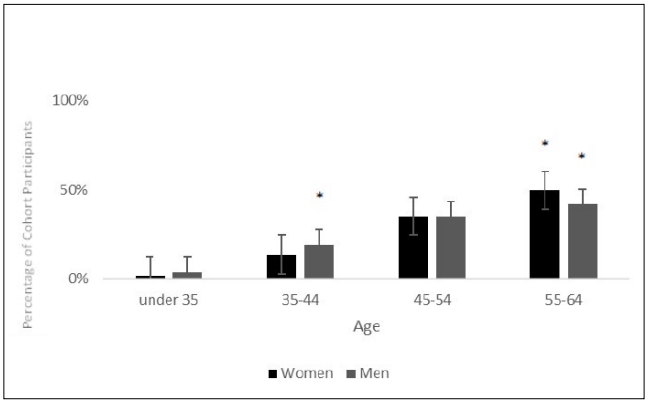

Figure 9: Average Cases of Diabetes Exam III: Women show a significance in the number of diabetic cases than men at the ages of 55-65 as compared to other age groups. The other age groups show men cases being higher than women, except at age 45-54. P values= 0.012, 0.007, 0.009

As in hypertension, post-menopausal women are found to have a higher BMI than men of the same age. This plays a large factor in the susceptibility of diabetes. Mississippi statistics 19 from the MDH state that more African American women reported being less active than their male counterparts and lacking essentials for a healthy diet such as fruits and vegetables. It is also a known fact that African Americans have acquired a predisposition to having diabetes and such risk factors through genetics. Diabetes Mellitus: an overview retrieved from the Cleveland Clinic tells of the factors that play a part in the acquisition of diabetes, both genetic and environmental. The most harmful is environmental because it is the factor that can be controlled such as diet and exercise. Environmental factors add on to the genetic factor which are uncontrollable giving people an even higher likelihood to have diabetes. One issue that was not stated with this data is whether participants of this cohort study had one or more of the other issues at hand: stroke, hypertension, and/or diabetes. The purpose of the final three comparison graphs is to show an average percentage of the combined CVD cases and compared men to women.

The purpose of these graphs is to show the overall likelihood of individuals having all three CVD types. Again, this data was a compilation of all datasets collected from the Jackson Heart Study (Figures 10-12). Data for (Figure 10) is compiled data sets for Exam 1 for stroke, hypertension, diabetes. In figure 10, the age group under 35 show a lower likelihood of having all three but men and women with the ratio between the genders showing no discrepancies. At the ages of 35-44, men have a higher likelihood than women. Likelihood between men and women at the ages of 45-54 show no discrepancy. Once the data is grouped together, women show a higher prevalence in the likelihood of having stroke, hypertension, and/or diabetes than men only at the ages of 55-64.

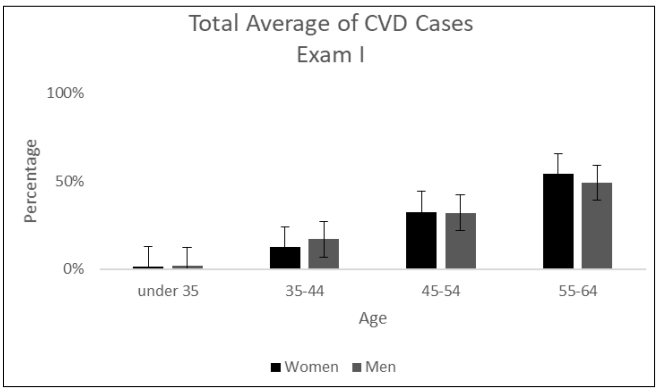

Figure 10: Total Average of CVD Cases Exam I: This graph gives an overall summary of the likelihood of men or women having all three conditions at one time. Women show a higher likelihood of having all three conditions at once. P value= 0.001, 0.0012

20 Collected datasets for Exam 2 are shown in (Figure 11). The age group under 35 show a lower likelihood of having all three but men percentages are slightly higher. At the ages of 35-44, men have a higher likelihood than women. From the ages of 45-54, the percentage for men are again slightly higher. Finally, at a later age, women show a higher likelihood of having all three CVD cases as compared to men which correlated with Figure 10.

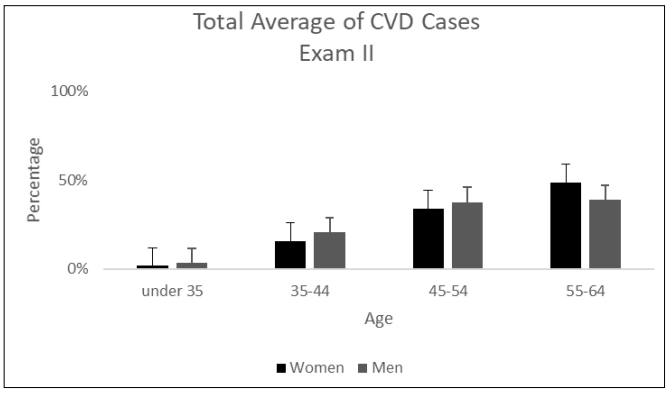

Figure 11: Total Average of CVD Cases Exam II: This graph gives an overall summary of the likelihood of men or women having all three conditions at one time. From this data, just as in Exam 1, women show a higher likelihood of having all three conditions. P value= 0.0003, 0.001.

The final comparison includes datasets for Exam 3 (Figure 12). The age group under 35 show a lower likelihood of having the three conditions with the ratio of men to women having little to no discrepancies. At the ages of 35-44, men have a higher likelihood than women. From the ages of 45-54, the percentage for men are again slightly higher. Finally, at a later age, women show a higher likelihood of having all three CVD cases as compared to men. From these three graphs, there is evidence that overall women have a higher prevalence of cardiovascular disease than men at a higher age as described in [Mosco et al (2004)]. Identifying the correlation of age between stroke, hypertension and diabetes over the years of the study.

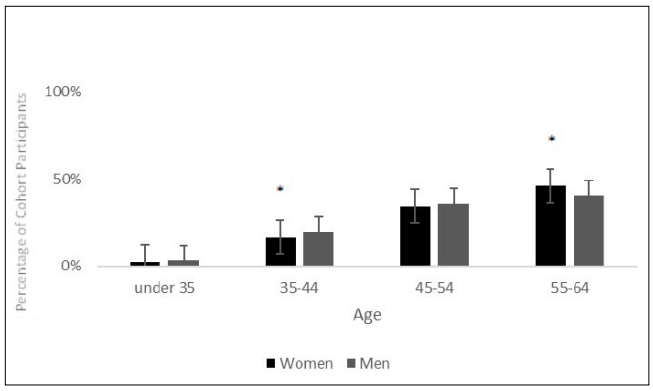

Figure 12: Total Average of CVD Cases Exam III: This graph gives an overall summary of the likelihood of men or women having all three conditions at one time. Women show an overall likelihood of having CVD incidences related to stroke, hypertension, and diabetes. P value= 0.0003, 0.001

The next objective of this study was to find a correlation being age and years of the data collected from the Jackson Heart Study and the relationship with stroke, hypertension, and diabetes. This was achieved in Figures 13-20. These figures are a collection of the Jackson Heart Study data to view a trend in age in the cohorts. Beginning with the incidents of stroke in women (Figure 13), there is a steady upward trend from ages under 35 to 64.

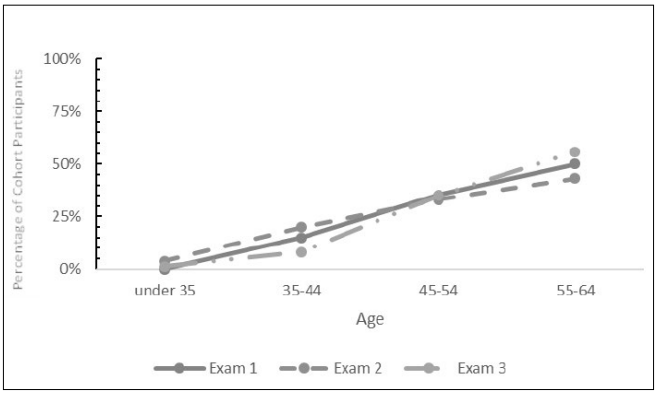

Figure 13: Trend in Incidences of Stroke in Women of JHS cohort: This graph depicts the trend of stroke incidence in women as age increases. Here we see there is little to no change in exam groups compared to age in stroke cases except the slight decrease in Exam III at ages 35-44.

A small deviation is seen in at 35-44 in Exam 3, but higher case numbers are found in age group 55-64 in the same Exam 3 when compared to other exams. Using (Figure 13) and 21 comparing it to (Figure 14), which is the incidents of stoke in men, there is a lower number of cases than women. However, the number of cases seem to double in Exams 2 and 3. These results can suggest that age may not play a significant role in stroke in men, but another factor plays a significant role in stroke for men. One of those factors is smoking. The MDH reported twice as many older men reported to be smokers as compared to women. Seeing that there was an increase in number of cases between Exam 1 and Exam 2 and 3 can be explained in Barker and Collo [8].

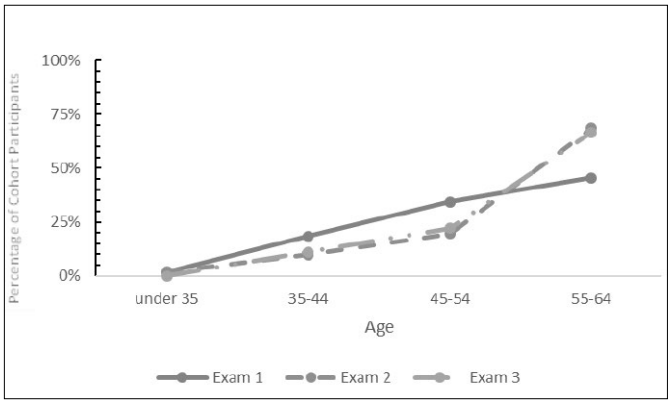

Figure 14: Trend in Incidences of Stroke in Men of JHS cohort: This graph depicts the trend of men with stroke incidences as age increase in each exam. There shows steady increase in men stroke case until the age 45-54 where there is a significant jump in the later years of Exam II and III.

These researchers review explicitly discussed how the prevalence of stroke in men have increase greatly but even more so after 2005. Trends in hypertension are depicted in (Figures 15 and 16). Statistics on women are shown in Figure 15.

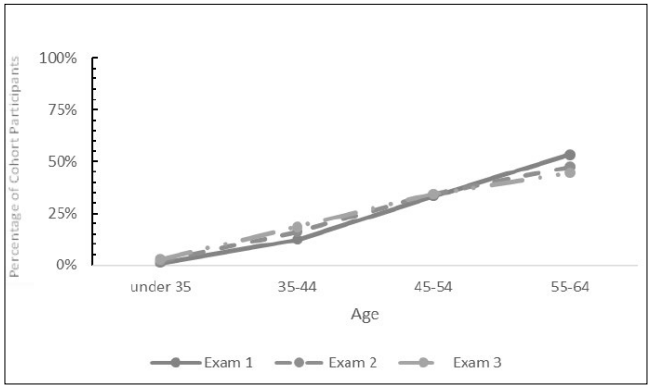

Figure 15: Trend in Incidences of Hypertension in Women of JHS cohort: This graph shows a steady increase in hypertension cases in women as they aged over the three exams. There is no deviation from the trend.

In this figure, there is another steady upward trend in case number as age increased with very little deviation. There seems to be an even number of cases at the ages of 45-54 in the three exams. With Figure 16, men have a higher number of cases of hypertension than women until ages 55-64 where theis fewer cases. This is easily seen in Exams 1 and 2. There is a lower number of cases as compared to women. The trend upward is not as stead and there is a significant increase in stroke cases after age 54. This is seen greatly in Exam 2 and 3.

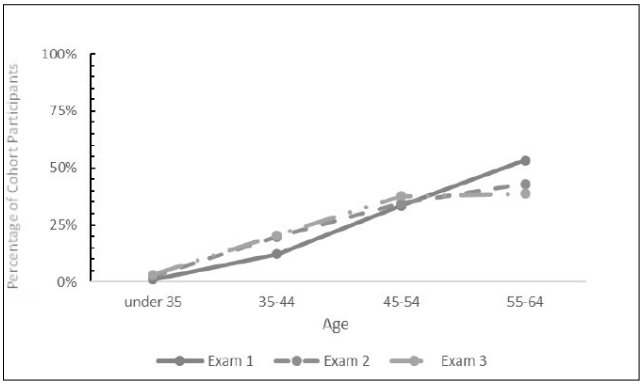

Figure 16: Trend in Incidences of Hypertension in Men of JHS cohort: This graph shows the trend in men with hypertension in the exam data as they age. Here shows a consistent trend upwards until age 45-54 where we see a slight decrease in later years.

The trends in cases of diabetes are seen in (Figures 17 and 18). Women showed another steady trend upward with an increase in number of individuals with diabetes (Figure 17). Diabetes in women was the most consistent between the Exams. Diabetes in men was less prevalent in the age groups 45-54 and 55-64 (Figure 18). Studies show that African American women in southern states such as Mississippi are more like to have diabetes 22 over men, but the prevalence is higher in both compared to Caucasian counterparts [9].

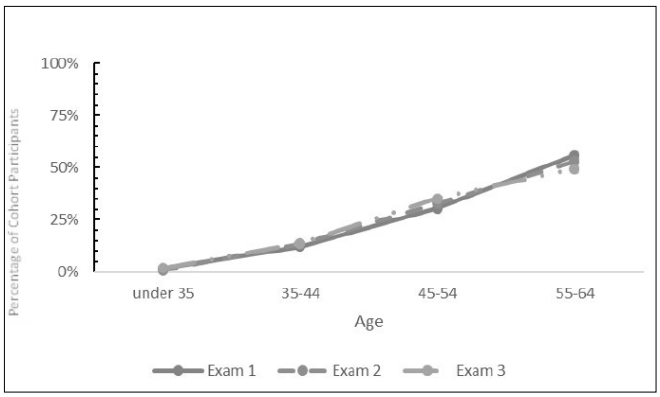

Figure 17: Trend in Incidences of Diabetes in Women of JHS cohort: This graph shows a steady increase in hypertension cases in women as they aged over the three exams. There is no deviation from the trend.

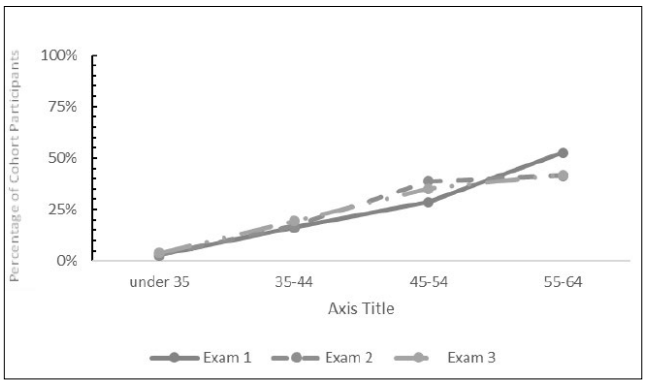

Figure 18: Trend in Incidences of Diabetes in Men of JHS cohort: This graph shows the trend in men with diabetes in the exam data as they age. Here shows a consistent trend upwards until age 45-54 where we see a slight decrease in later years.

The final two graphs give a visual of the trend of all three CVD incidence compared to age (Figures 19 and 20). In women, this graph shows the combination of data in stroke, hypertension, and diabetes in the three exams based on age. Just as in the prior graphs, there is a steady increase in these CVD incidences. This overview graph suggest that age plays a significant role in women with cardiovascular disease (Figure 19). Studies such as Daugherty et al (2011) and Mosca et al (2011) describes evidence that express how age a plays role in the overall health of women, especially when hormones play a role in CVD prevalence [6,10]. Research states that women at childbearing age are less likely to have a stroke but have a higher chance of having hypertension and diabetes.

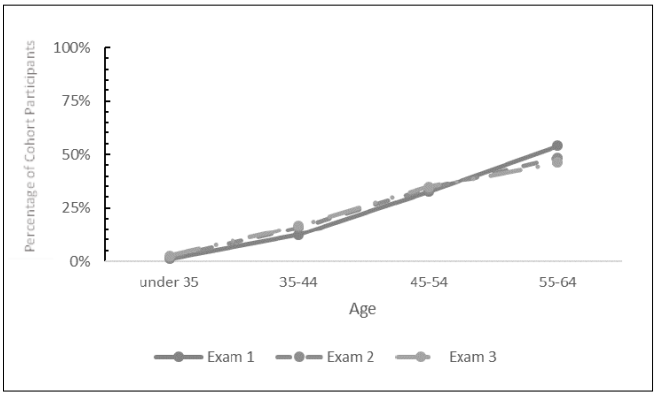

Figure 19: Trend in Overall Incidence in Women of JHS cohort: When combining data, women show a consistent trend upward with a higher likelihood of having all three CVDs

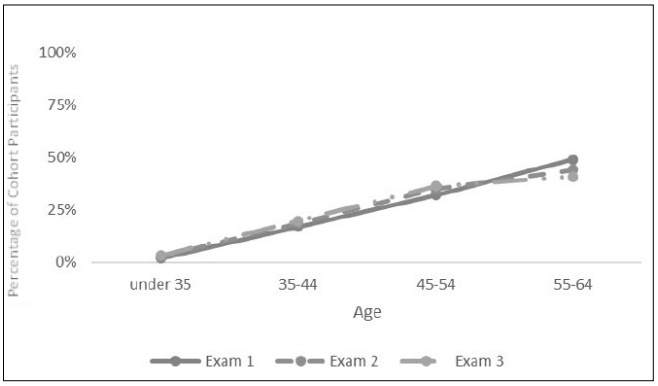

Figure 20: Trend in Overall Incidence in Men of JHS: When combining data, men show a less consistent trend upward. There is a slight decrease at age 55-64.

In men, this graph shows the combination of data in stroke, hypertension, and diabetes in the three exams based on age (Figure 20). Just as in the prior graphs, there is a steady increase in these CVD incidences until the age of 54 where there is a slight decrease. This overview graph suggest that age may play a role in some but not all CVD incidences. Studies have shown that age plays a part in stroke in men, but environmental factors are more of a risk factor for hypertension and diabetes. The final table in this study gives the P values calculated for the risk factors that where described (Table 1).

Table 1: Significance of Gender and Age on Risk Factors: This table represents the P values for the effects of age and gender on hypertension and diabetes

	Variable	P Value
Person Correlation		
Women	Diabetes	.001
	Hypertension	.000
Men	Diabetes	.000
	Hypertension	.000
Independent t test		
Women	Diabetes	.007
	Hypertension	.009
Men	Diabetes	.61
	Hypertension	.012

The software used was SPSS. These tests were used to correlated gender and age with these risk factors. The goal was to achieve a P value less than 0.005 to show the significance. From the graph, gender played a significant role in diabetes and hypertension as stated from the Pearson Correlation test. Age played a role in 23 hypertensions in both men and women, but on diabetes in women. This was also clearly depicted in earlier visual graphs.

Conclusions

The state of Mississippi holds one of the highest ranks for stroke and other cardiovascular disease. Mississippi is ranks second for stroke, second for diabetes, and score 5.1% higher than US statistics for stroke. In this longitudinal study, we observed that African American women develop stroke and other risk factors earlier and more common than African American men in the Jackson Heart Study Cohort. When comparing our data, we also can see there was a significant correlation between gender and hypertension and diabetes in both men and women (Table 1) (Figure 4-6) (Figure 7-9). With the t test there was a greater significance for women than in men in hypertension and equivalent significance in both men and women age increased (Table 1). The cohort of individuals who had stroke was deemed too small to reach any values but visually we can see a significant change in the number of men who reported having stroke versus women between the ages of 55-64 (Figures 1-3). Mosco et al, suggest that the annual death rate of stroke in women exceeds that of men, but it should not be confused with the morbidity rate of men. This means men are more likely to have survived the stroke over women at an older age [6].

Even though women have a greater life expectancy advantage, a stroke occurring later in life at a time when a women's health and ability to function independently are already compromised [11]. It is expected for women stroke rates to decrease in that age range because of an increase in death. The incidences of stroke are usually higher in men until older age of 85, with a higher incidence of stroke in women after age 85 years [12]. With hypertension and diabetes, our results suggest women increased in cases compared to men. In men from the age 54-65, there is a decrease in cases, but a higher number of 46 cases of hypertension in men at younger ages than women (Figures 4-16). For women to have a much higher rate of diabetes, the amount of body fat played a part in it. Research shows that a person's BMI plays a role in the chances of an individual having diabetes or hypertension other than genetics [13]. Men and women with high BMIs that are deemed obese also tend to live an unhealthy lifestyle which plays a part in the likelihood of having either diabetes or hypertension. Being over-weight and obese is more common in post-menopausal women than men which could explain why women are more prone to diabetes than men. Obesity is a significant cause of elevated blood pressure in women. Previous studies show that natural estrogens and natural progesterone protect the vascular system from oxidative and inflammatory injury, preventing CVD incidents prior to menopausal years [14]. Statistics for Mississippi and the result of this study correlates with reports submitted by the Mississippi Department of Health.

In 2011, stroke accounted for 5.3% of overall deaths in Mississippi and diabetes mellitus accounted for 3.4 of all deaths. Medical costs associated with chronic conditions are expected to increase up to 70% between 2010 and 2020 this number includes stroke, hypertension and diabetes [Report of Burden of Chronic Disease (2004)] [15]. Individually, stroke is predicted to increase by 70.7%, diabetes by 67.9%, hypertension by 65.4%. It has been reported that 39.6 percent of Mississippians have reported to have high blood pressure. Out of those Mississippians, 49

percent were black women and 43 percent were black men. Black females had the highest prevalence of high blood pressure [Report of Burden of Chronic Disease (2004)] [15]. Mississippi stroke data reported by the Mississippi Department of Health show a large gap in stroke death rates between black men and women. Black men had a percentage of 74.2% 47 for stroke death compared to women which was at 55.6%. Black males had the highest death rate due to stroke. Overall African Americans had a higher rate of death over Caucasians [Report of Burden of Chronic Disease (2004)]. For diabetes, the Mississippi Department of Health reported 17.6 percent of black women had diabetes compared to black men which was 14.6 percent while their Caucasian counterparts range from 9-10% with diabetes. These trends carry on up to recently reported data [Report of Burden of Chronic Disease (2004)]. Some factors to consider when looking at the data is the lifestyle of Mississippians. The Report of Burden of Chronic Disease (2004) reported the percentages of people who reported to not have and leisure or physical activity and current smokers. Amongst adults, 17.9% of black women reported not including physical activity in their weekly schedule along with men which was approximately 31.4% as compared to their Caucasian counterparts whose percentages ranged from 25-29% [Report of Burden of Chronic Disease (2004)]. Nearly 1 in 3 adults in Mississippi reported no leisure time physical activity. The percentage of blacks reporting no physical activity was greater than whites. Smoking increases chances of stroke. A higher proportion of males reported current smoking than females that is 29.5 % of black men reported to be current smokers compare to black women at 16.2% [Report of Burden of Chronic Disease (2004)].

Our results suggest that age plays an important role in the risk of developing stroke, hypertension, and diabetes. It can also be concluded that gender play an important role in the development of the stroke and other CVDs. The African American community has genetically been stricken with various risk factors that increased the chance of developing these diseases, 10-fold as compared to other race and ethnicities [9,16]. It is imperative that individuals maintain their health and avoid worsening risk factors for these diseases. This study will be continuing to observe the influence stroke prevalence in the Jackson Heart Study Cohorts.

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