Prevalence of Newly Diagnosed Hypertension in Stroke Patients Presented to Tertiary Care Hospitals in Rawalpindi

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ABSTRACT

Background and Aim: Stroke is defined as the sudden onset of neurological deficits caused by vascular supply disruption to brain-specific region, contributing as a major factor for mortality and morbidity worldwide. Globally, approximately two-thirds of cases of stroke are caused by hypertension as a major risk factor. The purpose of the current study was to determine the prevalence of stroke patients with newly diagnosed hypertension admitted to tertiary care hospital.

Materials and Methods: This cross-sectional study was carried out on 205 stroke patients admitted to the Department of General Medicine, Benazir Bhutto Hospital and Holy Family Hospital, Rawalpindi from April 2021 to March 2022. Prior to study conduct, ethical approval was taken from the institute research and ethical committee. Written informed consent was obtained from each individual. The participants underwent physical examination after using antihypertensive medication besides detailed history. Blood pressure was measured using standard mercury Sphygmomanometer. Patient having blood pressure ≥ 140/90 mm Hg was considered as hypertensive after measurement with difference of 10 minutes time span. SPSS version 25 was used for data analysis.

Results: The overall mean age was 59.6 ± 8.5 years. Of the total 205 stroke patients, there were 140 (68.3%) males and 65 (31.7%) females. Out of 205 patients, 60.5% were rural and 39.5% were urban. The literacy rate was 63.9%. Family history of smoking, diabetes mellitus (DM), and hypertension (HTN) among study population were found in 83 (40.5%), 76 (37.1%), and (31.7%) females. Out of 205 patients, 60.5% were rural and 39.5% were urban. The literacy rate was 63.9%. Family history included age, newly diagnosed hypertension, diabetes and smoking effect was stratified to see the deviations. Diabetes and smoking effect was stratified to see the differences.

Conclusion: The present study concluded that the prevalence of newly diagnosed hypertension was found higher among stroke cases. Early diagnosis of hypertension by proper screening and effective treatment can reduce the mortality and morbidity caused by stroke and hypertension.

Keywords: Hemorrhage, HTN, Ischemia, Stroke.

INTRODUCTION

Stroke is a neurological deficits due to disruption of vascular supply to the brain-specific regions. Globally, the increasing rate of morbidity and mortality are due to the stroke as a major risk factor. Hypertension is a major risk factor for stroke and the number of stroke events is directly related to the severity of hypertension [1-3]. Currently, approximately 54.5% of strokes are due to hypertension [4]. Mortality due to stroke increases proportionally with an increasing blood pressure [5]. Hypertension doubles the risk of both ischemic and hemorrhagic stroke [6]. Cerebrovascular complications of hypertension are more closely correlated with systolic than diastolic blood pressure [7]. Stroke contributes as second most prevalent factor accounted for 11.8% death cases worldwide followed by heart disease and about five million people die especially in developed countries each year due to stroke [8]. Significant increases were observed in the incidence, morbidity, and mortality of stroke in recent few decades [9].

Hypertensive patients had poor blood pressure control despite the antihypertensive agent’s availability [10]. Hypertension may not be diagnosed at an early stage and remain for prolong periods and becomes obvious as serious complications appears [11]. Identification of high risk to the estimated population of stroke is helpful for screening and prevention of healthcare. In developing countries, the prevalence of hypertension is 20% while undiagnosed hypertension was 14.4% [12, 13]. Stroke risk can be controlled up to 38% by adequate prevention of hypertension [14]. Hypertension screening programs and awareness improvement on the national level should focus on early detection and prevention of hypertension due to blood pressure complications. Although numerous studies investigated the frequency of already diagnosed hypertension in stroke patients. But there is scarcity of data regarding the newly diagnosed hypertension among stroke cases.

Therefore, the present study aimed to determine the prevalence of newly diagnosed hypertension in stroke patients.

MATERIALS AND METHODS

This cross-sectional study was carried out on 205 stroke patients admitted to the Department of General Medicine, Benazir Bhutto Hospital and Holy Family hospital, Rawalpindi from April 2021 to March 2022. Prior to study conduct, ethical approval was taken from the institute research and ethical committee. Written informed consent was obtained from each individual. All the participants underwent physical examination after using antihypertensive medication besides detailed history. Patient having blood pressure ≥ 140/90 mm Hg was considered as hypertensive after measurement with difference of 10 minutes time span. SPSS version 20 was used for data analysis. Detailed history included age, newly diagnosed hypertension, diabetes and smoking history, and presence of hypertension were recorded. Blood pressure was taken as an average of 2 measurements taken after the participants in the supine position in bed without crossing their legs with arms supported at heart level. Blood pressure was measured using a standard and regularly tested aneroid sphygmomanometer. The researcher recorded all the data into the pro-forma. SPSS version 20 was used for data analysis. Categorical variables such as gender, family history of HTN, history of diabetes, smoking, and newly diagnosed hypertension calculated and expressed in terms of frequency and percentage. Numerical variables such as age (years) and blood pressure (mm of Hg) were described as mean and standard deviation. Diabetes and smoking effect was stratified to see the variables effect on newly diagnosed HTN in stroke patients. The post-stratification test was applied using the chi-square test. P-Value ≤ 0.05 was taken as statistically significant.

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RESULTS

The overall mean age was 59.6 ± 8.5 years. Of the total 205 stroke patients, there were 140 (68.3%) males and 65 (31.7%) females. Out of 205 patients, 60.5% were rural and 39.5% were urban. The literacy rate was 63.9%. Family history of smoking, diabetes mellitus (DM), and hypertension (HTN) among study population were found in 83 (40.5%), 76 (37.1%), and 71 (34.4%) respectively. Based on computed tomography presentations, the prevalence of newly diagnosed hypertension (HTN) was 122 (59.5%). Out of 122 newly diagnosed hypertensive stroke patients, the incidence of ischemic stroke and hemorrhagic was 67 (54.9%) and 55 (45.1%) respectively. The mean value of diastolic and systolic blood pressure was 86.32 ± 12.62 and 125.59 ± 19.97 mm Hg respectively. Table-I represent the baseline characteristics of all the patients. Gender’s distribution of all the participants are illustrated in Figure-1. Table-II shows the age-wise distribution of all the stroke patients. The prevalence of family history of smoking, DM, and HTN is illustrated in Figure-2. Based on CT findings, different stroke types are depicted in Figure-3. Table-III shows the frequency of newly diagnosed hypertension.

Table-1: Baseline characteristics of stroke patients (n=205)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value of Frequency N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) mean ± SD</td>
<td>59.6 ± 8.5</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>140 (68.3)</td>
</tr>
<tr>
<td>Female</td>
<td>65 (31.7)</td>
</tr>
<tr>
<td>Urban</td>
<td>81 (39.5)</td>
</tr>
<tr>
<td>Rural</td>
<td>124 (60.5)</td>
</tr>
<tr>
<td>Education Status</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>131 (63.9)</td>
</tr>
<tr>
<td>Literate</td>
<td>74 (36.1)</td>
</tr>
<tr>
<td>Blood Pressure (mm Hg) mean</td>
<td></td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>86.32 ± 12.62</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>125.59 ± 19.97</td>
</tr>
</tbody>
</table>

Table-2: Age-wise distribution (n=205)

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 to 55</td>
<td>81</td>
<td>39.5</td>
</tr>
<tr>
<td>55 to 65</td>
<td>76</td>
<td>37.1</td>
</tr>
<tr>
<td>&gt;65</td>
<td>48</td>
<td>23.4</td>
</tr>
<tr>
<td>Total</td>
<td>205</td>
<td>100</td>
</tr>
</tbody>
</table>

Table-3: frequency of newly diagnosed hypertension

<table>
<thead>
<tr>
<th>Family History</th>
<th>HTN</th>
<th>Diabetes</th>
<th>Smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>71 (34.6)</td>
<td>87 (42.4)</td>
<td>71 (34.6)</td>
</tr>
<tr>
<td>No</td>
<td>134 (65.4)</td>
<td>118 (57.6)</td>
<td>134 (65.4)</td>
</tr>
<tr>
<td>Total</td>
<td>205 (100)</td>
<td>205 (100)</td>
<td>205 (100)</td>
</tr>
</tbody>
</table>

DISCUSSION

The present study focused on prevalence of newly diagnosed hypertension in stroke patients presented to the tertiary care hospital. It has been reported that male population are more susceptible to the newly diagnosed hypertension in stroke patients. The prevalence of hypertension in our study was 59.5% in stroke patients. All the newly diagnosed hypertension patients were ischemic and hemorrhagic stroke patients. Approximately one-third of the study group had family history of hypertension, diabetes mellitus, and smoking.

A previous study reported that ischemic stroke can be caused by several fixed and modified risk factor. Fixed risk factors are age, race and gender while diabetes (36.3%), hypertension (65%). Obesity (18%), dyslipidemia (32.7%) and smoking (32%) are the important modified parameters [19]. Ischemic stroke can be prevented by controlling blood pressure and sugar, lowering antplatelet and lipid and changes in life style [20]. Incidence of stroke can be reduced by modifiable parameters as fixed risk factors cannot be altered [21]. In USA, stroke is the third leading cause of death per annum. Stroke cause major morbidity proportion, productive life lost in young generations [22].

Hypertension is an important modifiable risk factor causing hemorrhagic and ischemic stroke with approximate 35% attributable risk [23]. A previous study found an increase in blood pressure of about 20 mm Hg per death by stroke in middle-aged people. Patient’s having a blood pressure higher than 150/90mm. Hg needs to be treated and prevented with proper guidelines, the incidence of stroke increases due to hypertension. Stroke risk can increase by blood pressure variability which may not record all the information. Clinical trials detected the importance of hypertension as a stroke risk factor by effective treatment. Stroke risk decreases 41% by systolic blood pressure reduction with 10 mm Hg [24, 25].
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...in blood pressure in their respective ages; systemic blood pressure contributed the most. An increase in systolic blood pressure of 10 mmHg and diastolic blood pressure of more than 110 mmHg increase the risk of stroke by 25%. Stroke risk is 15% more prevalent in individuals having more than 80 mmHg blood pressure. Higher blood pressure caused by drug therapy, high blood pressure resistible treatment, sub-optimal care, and non-compliance of patients [26, 27]. Among the adult population in Pakistan prevalence of 17.9% is caused by hypertension. The estimated number of cases of hypertension in Pakistan is about 10 million [28]. Stroke is diagnosed by neuro-imaging and clinically but Magnetic resonance imaging and computed tomography can characterize subtype stroke. Epidemiological studies observed and concluded the undiagnosed hypertension prevalence ranges from 4.8% to 8% among healthy individual [29, 30].

The current study investigated 205 cases of the stroke to find the frequency of newly diagnosed hypertension. The mean age of 205 stroke patients was 59.6 ± 8.5 years. The minimum and maximum age of individual patients was 45 and 75 years respectively. The exponential increase in stroke patients above 40 years of age was reported in various studies.

Age plays a key role in the risk of stroke. People with age above 45 years had 95% chances of stroke compared to the two-third of cases after 65 years of age. Incidence of stroke is more dominant in men as compared to the females as shown in our study with a male-to-female ratio of 2.5:1. Another study reported a 1.7:1 ratio of male and female giving double cases in male [31].

Older age and smoking are the causes of stroke dominancy in males. Undiagnosed hypertension with 58% prevalence before stroke was diagnosed after stroke. Our findings almost matched the other researcher studies who reported 49% to 58% compared to our findings of 59.5% hypertension [32].

CONCLUSION

The present study concluded that the prevalence of newly diagnosed hypertension was found higher among stroke cases. Early diagnosis of hypertension by proper screening and effective treatment can reduce the morbidity and morbidity caused by stroke and hypertension.

REFERENCES