Prevalence of Snoring among Stroke Patients and Associated Factors: Case Study of Ilorin Metropolis

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Abstract

Snoring is a hoarse or harsh sound from nose or mouth that occurs when breathing is partially obstructed during sleep, and it has been implicated as a predisposing factor to stroke in some individuals. Unfortunately, the association between snoring and stroke have not been fully explored in Nigeria, hence the need for this study.

This study involves 182 stroke patients from two public hospitals in Ilorin Metropolis. Patients were interviewed with the aid of questionnaire to determine the percentage of some specific parameters associated with snoring, which include; stroke patients that snore, stroke onset, sleeping position and snore severity.

The result revealed that out of 182 stroke patients, 131 (72%) snores while 51 (28%) do not snore. Consequently, out of this 131 stroke patients that snore, 27 patients (20.6%) were mild, 92 patients (70.2%) were moderate, 12 patients (9.2%) were severe. Thirty eight patients (29%) experienced stroke while sleeping, 93 patients (71%) experienced stroke while awake. Sleeping position enquiry revealed that 58 patients (44.3%) often sleep supine (back), 65 patients (49.6%) often sleep on their side and 8 patients (6.1%) often sleep prone (chest) before the onset of their stroke.

This study revealed that snoring is highly prevalent among stroke patients in Ilorin metropolis which indicates possibility of an association between snoring and stroke.

Key words: stroke, snoring, prevalence, epidemiology,

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Introduction

Snoring is the sound produced when there is relaxation of the uvula and soft palate during which tissue relax enough to partially block the airway resulting in irregular airflow and vibrations.[1] Simple snoring often represents the beginning of sleep-disordered breathing continuum, which ranges from partial airway collapse and mildly increased upper-airway resistance to complete airway collapse and severe obstructive sleep apnea lasting 60 seconds or more.[2] Also, simple snoring was significantly associated with elevated blood pressure independent of age, sex, and Body Mass Index.[3] The prevalence of snoring differs across ages and sex around the world, for example, in Nigeria it was discovered that 34% and 26% of men and women snore respectively.[3]

Snoring has been suggested to independently predispose individuals to stroke development,[4] because during this process, breathing is partially obstructed and turbulent airflow causes the pharyngeal tissues to vibrate, which transfers the vibration to the carotid arterial wall.[5] The transferred vibration lead to endothelial dysfunction, and promotes the development of early carotid atherosclerosis in heavy snorers.[5]Consequently, there is evidence that snoring with a prevalence of 44% can lead to stroke.[6]Snoring has also been associated with an increased risk of ischemic heart disease,[7] by the disruption of blood supply to the brain.[8,9]Stroke has become one of the leading causes of serious, long-term neurologic impairment, and functional disability.[10]Unfortunately, there has been limited data available to link snoring to stroke in Nigeria, thus this study aimed to estimate the prevalence of snoring in stroke patients in Ilorin, Northcentral, Nigeria.

Material and Methods

Experimental Design

182 In and out stroke patients from two public hospitals in Ilorin metropolis were randomly selected and responded to questionnaires in this study. These hospitals are namely; University of Ilorin teaching hospital and Kwara State General Hospital Ilorin. Ethical approvals were collected from both hospitals with reference numbers UITH/CAT/189/VOL.198/911 and GHI/ADM/134/ VOL.1/40 respectively. Subsequently, the patients (respondents) agreed to

participate in this study after their consent were sorted.

The age range of respondents was between 25-92 years, while the inclusion criteria was patients presents with ischemic stroke and exclusion criteria was patients without ischemic stroke.

The whole experiment lasted for 6 months, questionnaires were administered and interpreted for a period of 4 months by research assistant, after which the data were collated, analysed and interpreted.

Operational Definition of Terms

The onset of stroke; was determined by whether the stroke started while the patient was sleeping or awake.

Sleeping position; was determined either by been in supine position; lying on the back, side position; sleeping on one side and prone position; sleeping lying on the chest

Snore severity; the severity of snore was grouped under mild, moderate, and severe; mild snorers were patients that snores once a while, moderate snorers were patients with frequent snores but do not disturb and severe snorers were patients with loud snores i.e. disturbing snore.

Statistical Analysis

The frequencies in each category were divided by the total number of participants and multiplying by 100% to calculate the percentage and Graph-Pad Prism 7.00 was used to draw the pie-chart.

Results

The result revealed that, in fig. 1, out of these 182 patients 131 (72%) snores before and after the onset of their stroke while 51patients (28%) do not snore. Consequently, fig. 2 revealed that out of these 131 stroke patients that snore, 38 patients (29%) experienced a stroke while sleeping, 93 patients (71%) experienced stroke while awake. Figure 3, showed that

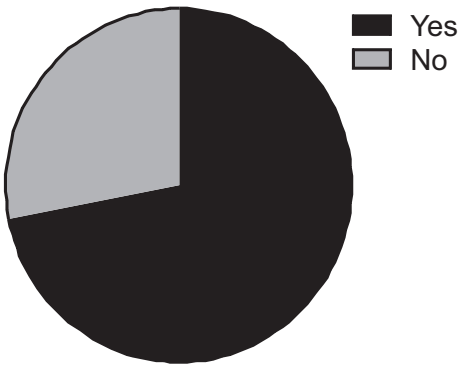


Figure 1: Stroke Patients that Snore

Figure 1: shows a total of 182 stroke patients entered for this study; it revealed that out of these 182 stroke patients 131 (72%) snores before and after the onset of their stroke while 51 (28%) do not snore. This table shows a strong link between snoring and stroke.

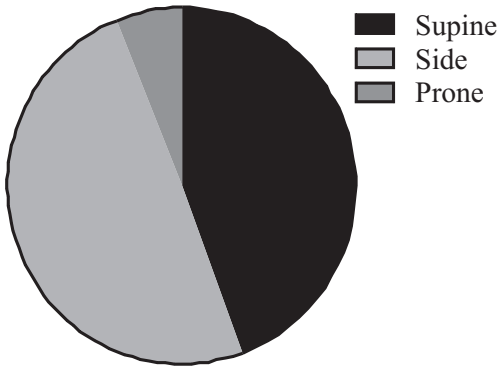


Figure 3: Sleeping Position

Figure 3: shows that out of 131 stroke patients that snore, 58 (44.3%) patients often sleep supine (back), 65 (49.6%) patients often sleep on their side and 8 (6.1%) patients often sleep prone (chest) before the onset of their stroke. This figure shows the patients irrespective of their sleeping positions, but most of them lie on one side while sleeping.

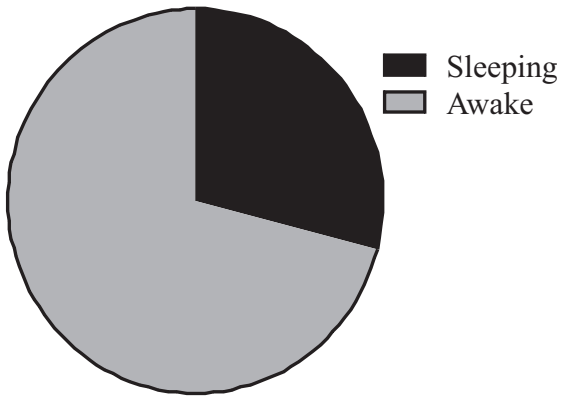


Figure 2: Stroke Onset

Figure 2: shows that out of 131 stroke patients that snore, 38 (29%) patients first experienced a stroke while sleeping or during the early morning hours and 93 (71%) patients first experienced a stroke while awake.

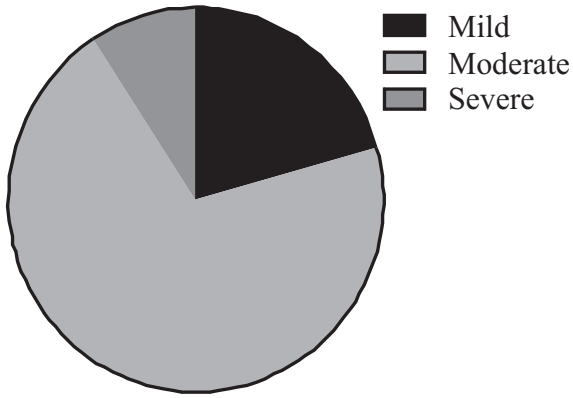


Figure 4: Snore Severity

Figure 4: shows that out of these 131 stroke patients that snore, 27 (20.6%) were mild, 92 (70.2%) were moderate and 12 (9.2%) were severe. This table reveals a strong link between moderate snoring and stroke.

58 patients (44.3%) often sleep supine position (back), 65 patients (49.6%) often sleep on their side and 8 patients (6.1%) often sleep prone (chest) position. Lastly, fig. 4 revealed that 27 patients (20.6%) were mild snorers with evidence of no paralysis, 92 patients (70.2%) were moderate snorers with evidence of one-sided paralysis, 12 patients (9.2%) were severe snorers with evidence of two-sided paralysis.

Discussion

This study described snoring as a predisposing factor to ischemic stroke, where it reports how many of these stroke patients snore, what was the onset of this stroke in these patients, the sleeping position of these patients before and after having a stroke, and what is the severity of snoring in these patients.

Among the 182 patients with stroke, snoring occurred in 131 patients, while 51 patients do not snore. This study suggests that among the stroke patients, there is a higher percentage of snorers and this finding agrees with a study that suggested that among 167 male patients with brain infarction, a history of snoring was the only significant factor explaining the diurnal variation of stroke onset.[11] Also, it has been established that snorers suffered brain infarction during sleep more often than non-snorers.[12]

The onset of stroke was determined by either the patient got it while sleeping or when fully awake, and it was revealed that out of 131 stroke patients that snore, 38 patients experienced stroke while sleeping and93 patients experienced stroke while awake, this implies that majority of the respondents were awake during the onset of the stroke. It can be further explained because ventilation is reduced in sleep compared with being awake, which is in parallel with the restorative changes that occur to heart rate, temperature, and blood pressure, which can be affected by brief (3–15 second) arousals that occur in response to changes in airflow. For example, in the case of obstructive sleep apnea and central sleep apnea which are predisposing factors of stroke.[13-15]

Sleep position was also considered to be a predisposing factor to snoring, as it was earlier ascertained that snoring leads to stroke. Therefore, it was imperative to found out among these patients with stroke, if their sleeping position can be a factor leading to stroke. It observed that, among the 131patients that snore, 58 patients sleeps mostly in a supine position, while 65 patients sleeps on one side position, and just eight8 patients sleeps in the prone position. This is evidence that majority of these patients either sleep on one side or in a supine position and sleeping on the side with a slightly higher percentage to those that sleep in the supine position, which was corroborated by previous studies that reported that the supine position as the worst sleeping position that leads to snoring.[16,17]

Furthermore, the severity of the snores was investigated among patients with stroke by taking into account if the snoring was mild, moderate, or severe, and it was revealed that out of the 131 patients that snore, 27 patients snores mildly, 92 patients were moderate snorers and 12 patients were severe snorers, this implies that occasional snorers i.e. moderate snorers took a large percentage of the population of patient with stroke, therefore this study like most previous studies, cannot distinguish the effects of simple snoring from heavy snoring on the risk of stroke.[18-21]

Conclusion

This study suggests that there is a high percentage of snorers among patients with stroke in Ilorin metropolis. Furthermore, this study also observed that majority of these patients that snores were awake at the onset of their ailment while few got their stroke during sleep. The sleeping position of the patients that snore can also be a predisposing factor to ischemic stroke as the majority of them either sleep on one side or in a supine position while just a few of them lay on their chest (prone position). Lastly, moderate snorers are more predispose to ischemic stroke. Therefore, snoring is an independent risk factor for the development of stroke. There is a possibility that snoring itself, independent of any other factors lead to stroke is a plausible hypothesis and so it should be taken seriously especially when it is a cause for the disturbance.

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Conflict of Interest

No conflict of interest declared by the authors

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