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# PREVALENCE OF SLEEP BREATHING DISORDERS IN PATIENTS WITH CEREBROVASCULAR STROKES

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**Thesis**

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**CHEST DISEASES**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿ وَمِنْ آيَاتِهِ مَنَامُكُمْ بِاللَّيْلِ وَالنَّهَارِ وَابْتِغَاؤُكُمْ مِنْ

فَضْلِهِ إِنْ فِي ذَلِكَ لآيَاتٍ لِقَوْمٍ يُسْمَعُونَ ﴾

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## *Abbreviations*

AF	Atrial fibrillation
AHI	Apnea hypopnea index
ALS	Amyotrophic lateral sclerosis
AP	Intraarterial pressure
BFV	Blood flow velocity
CBF	Cerebral blood flow
CBV	Cerebral blood volume
CCA	Common carotid artery
CHD	Coronary heart disease
CMR <sub>glu</sub>	Cerebral metabolism of glucose
CMR <sub>O<sub>2</sub></sub>	Cerebral metabolic rate of oxygen
CNS	Central nervous system
CPP	Cerebral perfusion pressure
CSA	Central sleep apnea
CVS	Cerebrovascular stroke
EMG	Electromyogram
EMG <sub>di</sub>	Diaphragmatic electromyogram
EMG <sub>ge</sub>	Genioglossal electromyogram
EOG	Electro-oculogram
HDL	High density lipoprotein
Hz	Hertz
ICA	Internal carotid artery
ICP	Intracranial pressure
LDL	Low density lipoprotein
Lt	Left
MCA	Middle cerebral artery
OA	Obstructive apnea

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*Abbreviations (contd.)*

OSA	Obstructive sleep apnea
PaCO <sub>2</sub>	Arterial carbon dioxide tension
PaO <sub>2</sub>	Arterial oxygen tension
PET	Positron emission tomography
PETCO <sub>2</sub>	End tidal CO <sub>2</sub>
PICH	Primary intracerebral hemorrhage
RI	Right
SAH	Subarachnoid hemorrhage
SAS	Sleep apnea syndrome
TCD	Transcranial Doppler sonography
TIA	Transient ischemic attack
TST	Total sleep time
TWT	Total wake time
VD	Diastolic velocity
V <sub>M</sub>	Mean velocity
V <sub>S</sub>	Systolic velocity

**\* TABLE OF ERRATA \***

<b>Page</b>	<b>Line</b>	<b>Wrong</b>	<b>Correct</b>
14	6	There	This
16	12	Hyperventilation	Hypoventilation
17	3	Increasing ventilation	Increasing both ventilation
24	4	Pco <sub>2</sub>	Paco <sub>2</sub>
74	9	Three	Six
74	16	addition	and 3 due to parietal infarction
91	15	abstractive	Obstructive

*Introduction &  
Aim of the Work*

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## **INTRODUCTION**

It is currently accepted that a causal relationship exists between cerebrovascular accidents and sleep breathing disorders. Sleep breathing disorders are associated with a higher incidence of ischemic heart diseases (**Koskenvuo et al., 1987**), hypertension (**Koskenvuo et al., 1985**), polycythemia (**Harrison et al., 1981**), changes in intracranial vascular blood flow (**Daly et al., 1990**), all of them are considerable risk factors for the development of cerebral infarction or hemorrhage.

Snoring even without evidence of manifest sleep apnea is incriminated on its own to be associated with a higher incidence of cerebral infarction (**Palomaki, 1991**). On the other side of view, cerebrovascular accidents are often mentioned on the list of causes of sleep breathing disorders (**Millman & Fishman, 1988**), cases with brain stem infarction in particular are reported to develop snoring with obstructive sleep apneic episodes (**Askenasy & Goldhammer, 1988**).

Little is known about the prevalence of sleep breathing disorders in patients recovering from acute cerebrovascular accidents and the factors contributing to the development of these disorders.

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## **AIM OF THE WORK**

The aim of this study was to assess the prevalence of breathing disorders in cases with acute cerebrovascular strokes, with correlation of the extent of these disorders to the different neurological patterns of cerebrovascular strokes.



*Review of  
Literature*

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# **REVIEW OF LITERATURE**

## **Definitions**

- ◆ **Sleep apnea:** It is defined as a greater than ten seconds pause in respiration during sleep.
- ◆ **Hypopnea:** A fall in the tidal volume by more than 50%.
- ◆ **Obstructive sleep apnea (OSA):** It is considered to occur when airflow is interrupted by an obstruction in the upper airway. There is no airflow despite of respiratory effort.
- ◆ **Central sleep apnea (CSA):** The respiratory center fails to initiate respiratory effort, so there is no airflow or respiratory effort.
- ◆ **Mixed sleep apnea (MSA):** There is absence of respiratory effort followed by unsuccessful respiratory efforts. It is a combination of both central and obstructive apnea.

Apneic episodes that occur at sleep onset or during bursts of rapid eye movement in REM sleep should not be considered pathologic, since they occur in normal populations (**Phillipson, 1978**). These are of short duration (10-20 sec), central in origin, and usually not associated with EEG arousal.

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