

## ORIGINAL RESEARCH ARTICLE

# Erectile Dysfunction in Older Male Stroke Patients: Correlation between Side of Hemiplegia and Erectile Function

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### ABSTRACT

This study was conducted to determine the effects of hemiplegia on erectile function in stroke patients. One hundred and five stroke patients grouped into left (61.78±7.79 years) and 55 right hemiplegic (62.11 ± 9.32 years) and 40 age-matched controls (64.00± 8.53 years). The International Index of Erectile Function questionnaire was used for data collection. One way analysis of variance and Spearman correlation tests were used in data analysis. Erectile function was significantly decreased in the both right (IIEF-5, 7.55 ± 4.07) and left hemiplegic groups (IIEF-5, 10.40 ± 5.70) compared with the control group (IIEF-5, 20.50 ± 4.27)  $p < 0.05$ . Side of hemiplegia significantly correlated with erectile dysfunction at  $p < 0.01$ . Conclusively, stroke mostly affects erectile function of right hemiplegia (*Afr J Reprod Health* 2009; 13[2]:49-54).

### RÉSUMÉ

**Dysfonctionnement érectile chez les patients d'âge plus avancé qui souffrent de l'attaque d'apoplexie : corrélation entre le côté de la hémiplégié et le dysfonctionnement érectile.** L'étude avait pour objectif de déterminer les effets de la hémiplégié sur le fonctionnement érectile chez les patients souffrant de l'attaque d'apoplexie. Cent cinq patients qui souffraient de l'attaque d'apoplexie regroupés en 50 hémiplégié de gauche (61,78±7,79ans) et 55 hémiplégié de droit (62,11±9,32ans) et 40 groupes témoin appariés suivant l'âge (64,00±8,53 ans). Les données ont été recueillies à l'aide des questionnaires de l'indice international du Dysfonctionnement Erectile. Une analyse à sens unique de variance et des tests de corrélation de Spearman ont été utilisés pour analyser les données. La fonction érectile a baissé de manière importante dans les groupes hémiplégiés de droit (HEF – 5,7,55±4,07) et de gauche (11EF – 5, 10,40±5,70) par rapport au groupe témoin (11EF – 5, 20,50±4,27)  $P < 0,05$ . Le côté de l'hémiplégié était en corrélation significative avec le dysfonctionnement érectile ( $p < 0,01$ ). En conclusion, l'apoplexie affecte surtout le fonctionnement de l'hémiplégié de droit (*Afr J Reprod Health* 2009; 13[2]:49-54).

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KEYWORDS: Stroke; Hemiplegia; Erectile dysfunction

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## **Introduction**

Patients and their families are frequently faced with changes in sexual behavior after the onset of a neurologic disability<sup>1</sup>. Despite the high prevalence of stroke, little information is available on sexual functioning and sexual satisfaction following stroke<sup>2</sup>.

Frequent association between sexual dysfunction and cardiovascular disease has been established<sup>3</sup>. According to Schwarz and Rodriguez<sup>4</sup> most patients with chronic cardiovascular diseases experience decreased libido and frequency of sexual activity, as well as erectile dysfunction(ED). Many factors are believed to contribute to the development and maintenance of ED. The influence of age and of several medical conditions (diabetes, vascular disease, and chronic diseases such as hepatic failure, renal failure and dialysis) is well defined. Also well documented is the role of some drug groups, whereas the role of other pharmacological agents is still controversial because of the frequent coexistence of other pathological conditions or concomitant exposure to other drugs. Less well defined and sometimes controversial is the role of risk factors mainly related to life-style such as cigarette smoking, alcoholism, total cholesterol levels and certain types of trauma<sup>5</sup>.

ED has been defined by the National Institutes of Health (NIH) Consensus Panel on Impotence as the persistent inability to attain and maintain an erection sufficient to permit satisfactory sexual performance<sup>6,7</sup>. Many studies<sup>8,9</sup>

have reported marked decline in sexual activity in stroke patients and most of these studies have included patients with age less than 50 years old. Little information, however, is available on clinical correlates of erectile dysfunction and side of hemiplegic in stroke patients. Therefore the purpose of the present study was to investigate the effect and correlation between erectile dysfunction and side of hemiplegic in older stroke patients.

## **Methods**

### *Subjects*

The subjects for the study consisted of 145 male subjects: 105 hemiplegic patient due to stroke (50 left [g1] and 55 right hemiplegic [g2]) attending Physiotherapy department of Murtala Muhammed Specialist Hospital, Kano-Nigeria; and 40 normal (control [g3]) subjects from the general population. All subjects were right handed prior to stroke attack.

*Inclusion criteria:* Only those who volunteered to participate in the study through written and signed informed consent were recruited. Subjects with age above 50 years with chronic and stable (> 1 year duration) history of a single stroke attack (SBP between 120-160 & DBP between 80-90 mmHg) were selected. Only those who had stopped taking antihypertensive drugs were selected. They were sedentary and have no history of psychiatry or psychological disorders

or abnormalities and were right handed prior to stroke attack.

*Exclusion criteria:* Obese (body mass index [BMI]  $>30\text{kg/m}^2$ ), smokers, alcoholic, diabetics, other cardiac, renal, respiratory disease patients were excluded.

### *Study design*

Age matched independent groups design was used in data collection.

### *Data collection*

The instrument for data collection was the 5-item version of the International Index of Erectile Function (IIEF)<sup>11</sup> to determine the prevalence of ED. This questionnaire consists of only five questions and each IIEF-5 item is scored on a five-point ordinal scale where lower values represent poorer sexual function<sup>12</sup>. Thus, a response of 0 for a question was considered the least functional, whereas a response of 5 was considered the most functional. The possible scores for the IIEF-5 range from 1 to 25 (one question has scores of 1-5), and a score above 21 was considered as normal erectile function and at or below this cutoff, ED. According to this scale, ED is classified into four categories based on IIEF-5 scores: severe (1-7), moderate (8-11), mild to moderate (12-16), mild (17-21), and no ED (22-25). Individual was assured of a total guarantee of confidentiality. The questionnaires were collected immediately from all the respondents.

### *Data analysis*

The coded responses on the IIEF were then entered on the computer general purpose coding forms. They were analyzed using the the statistical package for the Social Science (SPSS) window version 14.0 Chicago, IL; USA. ANOVA and Duncan post hoc analysis was used (in the SPSS ANOVA, data were entered as ordinal data).Spearman correlation test was also computed. A value of  $P<0.05$  was considered statistically significant.

### **Results**

The subject's age ranged between 50 and 78years. Mean age  $\pm$  SD: right hemiplegic ( $62.11\pm 9.32$  years); left hemiplegic ( $61.78\pm 7.79$  years) and Control ( $64.00 \pm 8.53$  years). Subjects mean blood pressure  $\pm$  SD: right hemiplegic (systolic blood pressure) [SBP],  $150.00\pm 5.00$ ; diastolic blood pressure [DBP],  $85\pm 6.25$  mmHg); left hemiplegic ( $160.00\pm 8.00$ ; DBP,  $80.00\pm 4.00$  mmHg); control ( $140.00\pm 6.00$ ;  $80.00\pm 2.00$  mmHg). Table 1 showed group mean and SD values for IIEF. Result of the present study indicated significant effect of stroke on erectile function. Table 2 analysis of variance (ANOVA) showed that groups erectile function values differ significantly ( $F = 106.834$ ,  $p = 0.000$ ).

Table 3 further showed a significant effect of stroke on erectile function of both types of hemiplegic  $p<0.05$ . Post hoc (Duncan) analysis indicated significant effect of stroke on left

hemiplegic over control subjects (g1 and g3 [f=11.100, p=0.000]), right hemiplegic over control subjects (g2 and g3 [f=13.955, p=0.000]). Right hemiplegia also significantly differs and most affected compared to left hemiplegia (g2 and g1 [f=2.855, p=0.013])

**Table 1:** IIEA Scores (mean±SD, N=145)

Groups	n	IIEA values (mean±SD)
Right hemiplegia	55	7.55± 4.07
Left hemiplegia	50	10.40±5.70
Control	40	21.50±4.27

Spearman correlation test showed significant correlation between hemiplegia, side of hemiplegia and ED at 0.629 and 0.513 respectively at p<0.01.

## Discussion

The results of the present study, aimed at assessing the effects of stroke and side of hemiplegia on erectile functioning, revealed a significant decline in erectile function in stroke patients. Result of the present study also indicated significant effect of side of hemiplegia on erection. The results of the present study generally agree with the previous studies<sup>8,9,13</sup>. A closely related study was conducted by Jung et al<sup>14</sup>, they investigated the effect of stroke and the location of brain lesions on sexual functioning. They conducted a survey study on 109 male stroke patients (64.93±8.81years) and 109 age-matched controls (64.69 +/- 8.85 years) using the IIEF-5 version questionnaire. They reported a significant decrease in erectile function in the stroke patient group (IIEF-5, 5.89 +/- 7.08) compared with the control group (IIEF-5, 10.67 +/- 7.10).

**Table 2:** Effect of stroke on erectile function of hemiplegic patients (ANOVA)

Variable	Source of variation	SS	DF	MS	F	P
IIEF value	Between Trials	4808.502	2	2404.251	106.834	<0.001*
	Within Trials	3195.636	142	22.504		
	Interaction	8004.138	144			

\*significant, p < 0.05

**Table 3:** Post hock paired comparison (Duncan)

	g1	g2	g3
Left hemiplegia g1	-	2.855*9(p=0.0130)	11.100*(p=0.000)
Right hemiplegia g2	2.855*(p=0.013)	-	13.955*(p=0.000)
Control g3	11.100*(p=0.000)	13.955*(p=0.000)	-

p < 0.05, \* significant

Optimal male sexual function requires a host of psychological, hormonal, vascular and neurological agents acting in concert. The normal male sexual function is chiefly a vascular phenomenon that begins with an influx into the penile chambers; these vascular occurrences are enabled by numerous other hormonal, neurological and psychological events. There are important neural impulses responsible for redirecting blood flow from the internal pudendal artery into the penile chambers. These can be generated from the brain, or from a reflexive pathway. Additionally, the correct hormonal milieu must also be present to permit adequate sexual function. The importance of psychological health in successful erectile function is also evidenced by the adverse effects of psychogenic factors such as anxiety, depression and lack of sensate focus on erectile function<sup>4</sup>. The significant reduction in erectile function of hemiplegic patients in the present study might not be unconnected to the depression, fear and anxiety associated with hypertension and stroke, also long term residual effects of previously taken antihypertensive drugs<sup>6,8,10</sup>. Hemiparesis, spasticity that make proper coital position cumbersome, reduced body and self-esteem as a result of stroke might be factors worth considering.

The present study reported a significant correlation between sides of hemiplegia and erectile dysfunction and that right stroke is more affected. This finding is in agreement with the study of Jung et al<sup>14</sup>, they reported a significant correlation and concluded that case with

lesions in the in the right cerebellum and left basal ganglia reported a significant ejaculation disorders and decrease of sexual desire were more likely to occur respectively. The reasons for the significant correlation and increased in right hemiplegic ED could be linked to hemispheric dominance and specialization<sup>8,14,15,16</sup>. Hemispheric specialization is related to the dominance of hand. In right handed individuals, who constitute 91% of human population, the left hemisphere is the dominant or categorical hemisphere<sup>17</sup>. Lesion in the left basal ganglia affecting libido could in turn affect the right hemiplegic erectile function.

Though, the present study indicated significant effect of stroke on erectile function and that the sides of hemiplegia significantly correlated with ED. However, there some limitations of the study; it included the subjective assessment of brain lesion area via side of hemiplegia and pre-stroke handedness, also few numbers of participants. Future studies are warranted to objectively correlate the area of brain lesion with side of hemiplegia using advanced diagnostic tools such computerized topography scan (CT scan) and to involve larger sample size.

## **Conclusion**

Based on the result of the present study, it was concluded that stroke affects the erectile function of hemiplegic patients and the extent of the affectation depend on the side of hemiplegia.

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