

## MOTORCYCLING AS A RISK FACTOR FOR ERECTILE DYSFUNCTION: IMPLICATIONS FOR APPROPRIATE INTERVENTION AND PREVENTION STRATEGIES.

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### ABSTRACT

**Background:** Erectile dysfunction (ED) is a major family health problem. This study aimed to investigate the role of motorcycling, a popular means of transportation in Nigeria as a risk factor for erectile dysfunction.

**Methods:** This was a cross-sectional study designed to assess the presence of erectile dysfunction among registered motorcyclists in Uyo, South-South, Nigeria. Data was collected using the abridged version of the international index of erectile function (IIEF-5). Ethical considerations were resolved with the University of Uyo Teaching Hospital Health Research & Ethical Committee. The seventeenth version of the statistical package for social sciences (SPSS 17.0) was used for statistical analysis.

**Results:** Nine hundred and eighty-eight (84%) registered motorcyclists agreed to participate in the study. The mean age of respondents was 31.10 years. The overall prevalence of ED among the respondents was 57.5%; made up of mild (18.5%), mild to moderate (14.8%), moderate (13.1%) and severe (11.1%). In this study, the use of alcohol was not significant among respondents with erectile dysfunction ( $p=0.30$ ). Smoking of cigarette was prevalent among them ( $p=0.001$ ), and the number of hours spent per day in operating the motorcycle was significant for erectile dysfunction ( $p=0.001$ ).

**Conclusion:** It is concluded that motorcyclists, physicians and policy makers need to know the inherent danger in motorcycle operation with respect to erectile dysfunction, with a view to working out appropriate intervention and prevention strategies.

**Keywords:** Erectile Dysfunction, Motorcycling, Family Physician.

### INTRODUCTION

Erectile dysfunction (ED) is the persistent or recurrent inability to achieve and/or maintain an erection sufficient for satisfying sexual performance<sup>1</sup>. It is a problem with arousal difficulty and is one of the most common disorders of sexual functions in men<sup>2</sup>. ED is not a disease but a secondary condition brought about by several other factors. Although it is not life threatening, its effects can be profound and far reaching. Erectile dysfunction has great influence on both the individual's well-being and quality of life<sup>3</sup>. It interferes with a man's self-esteem, interpersonal relationships, and overall sense of well-being<sup>4</sup>. ED can also cause profound psychological, social and physical morbidity, and may completely destroy the man's ego<sup>6</sup>.

Erectile dysfunction today has a crudely estimated incidence rate of 25.9 cases per 1000 man-years based on the follow-up conducted in the Massachusetts ageing study in men [7].

The estimated global prevalence of ED in 1995 was 152 million and it was projected that the global prevalence will rise to 322 million by

2025 with the greatest increase likely to be in the developing countries of Africa, Asia and South America<sup>7</sup>.

As population ages, and with newly available and much publicized medical treatments, there will likely be challenging policy issues regarding erectile dysfunction in nearly all countries of the world. Population studies estimate a global prevalence of between 32% and 52% for all grades of erectile dysfunction<sup>8</sup>.

In Nigeria, however, data on issues of ED is generally scarce in scientific literature. This may be a result of the fear that sufferers are afflicted with, which culminates in their being shy to discuss their sexual problems thus checking stigmatization. Moreover, in the Nigerian society, discussing sexual matters outside the confines of the bedroom is generally regarded as a taboo<sup>9</sup>. The reported prevalence of erectile dysfunction in Nigeria is 57.4%<sup>10</sup>.

The erectile response in men is a vascular event initiated by neuronal action and maintained by a complex interplay between vascular and neurological events<sup>11,12</sup>. Normal

erectile function requires the coordination of psychological, hormonal, neurological, vascular and cavernosal factors. Alteration in any one of these factors is sufficient to cause erectile dysfunction<sup>13,14,15</sup>.

The aetiology of ED may be organic or psychologic, but often the cause is multifactorial. It can be a result of several factors ranging from advancing age<sup>16,17</sup>, certain forms of lifestyle<sup>18,19</sup>, side effect of drugs<sup>20</sup>, systemic diseases<sup>21,22</sup>, to neurological and psychological disorders<sup>23</sup>. Moreover, changing cultural attitude and demographic shifts in the populations have highlighted the pervasiveness of sexual concerns in all ethnic and age groups.

The motorcycle has been a popular mode of transportation for many Nigerians. It is used for well-known exercises and recreation especially among men but mostly for commercial purposes. The motorcycle is known by various names among the diverse cultural and ethnic groups in Nigeria. Such names include: *Aka-uke* and *Alalok* in many parts of Cross River and Akwa Ibom States, *Going* in some Northern parts of the country, and in Edo State and many other parts of Nigeria the names: *how far* and *Okada* have been used liberally. The popularity of the motorcycle among Nigerians may be because of its low cost of purchase and maintenance, its good fuel efficiency and easy maneuverability in urban congestion. Motorcycles consume fewer resources than other automobiles and in congested urban areas; it can save riders travelling time. Moreover, motorcycles offer a compact, easy-to-pack solution for those in urban areas where parking lots can be limited. Riding the motorcycle can help a biker to get connected with his or her surroundings and can bestow a subjective sense of freedom with the ability to expand their social network because of opportunities to meet new people. The motorcycle is a ready source of self-employment for most Nigerian men in the low socio-income brackets who use it for haulage of goods and people from one place to another.

In spite of its many benefits, lots of opinion has been given about the dangers of motorcycling. These include: increase in intra-city road traffic accidents<sup>24</sup>, low back pain<sup>25</sup>, and the danger motorcycling poses to the sexual health of men<sup>26</sup>.

The aim of this study was to investigate the role of motorcycling, a popular means of transportation in Nigeria, as a risk factor for erectile dysfunction.

## SUBJECTS, MATERIALS AND METHODS

This was a cross-sectional descriptive study carried out among professional motorcyclists, all men, aged 18 to 50 years in Uyo, Akwa Ibom State of Nigeria. Professional motorcyclists include those cyclists who register with the State government through the Akwa Ibom Professional Commercial Motorcyclists Association (APCOMA). Akwa Ibom State is situated in the south-south geopolitical zone of Nigeria, and is a leading oil producing area in the Niger Delta Region of the country. It has a population of about 3.9 million people.

A total of 1,180 motorcyclists (all men) were registered with the motorcyclist union in the State at the time of the study. However, only 988 cyclists (84%) agreed to take part in the study. The sampling was purposive. The study period spanned from January to May 2009.

The motorcyclists who gave consent to participate in the study were assessed for the presence and severity of erectile dysfunction using the abridged version of the international index of erectile function (IIEF-5)<sup>27</sup>.

The questionnaire was administered to the respondents by trained interviewers who consisted of two senior resident doctors in the Department of Family Medicine of the University of Uyo Teaching Hospital. Respondents who were below 18 years or above 60 years of age were not recruited into the study. English and "Ibibio" (vernacular), the commonly spoken languages in the community were used by the interviewers depending on the respondent's literacy level.

The IIEF-5 was developed for use in clinical practice setting as an efficient and accurate screening tool to identify the presence and severity of erectile dysfunction<sup>28</sup>. It was designed as a self-administered questionnaire. However, it was necessary to engage interviewers to administer the questionnaires because of the level of education of most of the respondents.

The IIEF-5 has been widely used in many countries including Nigeria to detect the presence and severity of erectile dysfunction<sup>28,29,30</sup>. Based on the IIEF-5 scores, the

severity of erectile dysfunction was classified into severe (0-7); moderate (8-11); mild to moderate (12-16); mild (17-21) and no dysfunction (22-25)<sup>28,30</sup>.

Other information obtained from respondents using the interviewer administered questionnaire included: age, sex, highest level of education attained, frequency of alcohol use which was classified into occasional, always and never. Others include: information on frequency of cigarette use which this was classified into currently smoking, smokes occasionally, have stopped smoking and never smoked before; and number of hours spent riding the motorcycle each day.

The data collected were analyzed using the Statistical Package for Social Sciences (SPSS 17.0). Comparisons of categorical data were done using chi square test. The p-value of equal

to or less than 0.05 was used to determine the level of statistical significance.

## RESULTS

Of the 988 participants recruited into the study, the age bracket with the largest number of respondents was 30 - 39 years: 310 (31.3%). Respondents aged =19 years presented with the greatest number of cases of erectile dysfunction 187(18.9%).

Table I shows the socio-demographic characteristics of the respondents. Three hundred and forty-five (35.0%) respondents were single. A total of 145 (14.7%) respondents had no formal education; one hundred and thirty-one (13.3%) respondents were trained in various forms of vocation; while four hundred and seventy-six (48.2%) respondents lived in the urban areas.

**Table I: Socio-Demographic Characteristics of the Respondents and Prevalence of Erectile Dysfunction (ED)**

Variables	Subjects		
Age in years	With ED N (%)	Without ED n (%)	TOTAL n (%)
<19	187 (18.9)	52 (5.3)	239 (24.2)
20-29	158 (16.0)	54 (5.5)	212 (21.5)
30-39	102 (10.3)	208 (21.0)	310 (31.3)
40 - 49	64 (6.5)	74 (7.5)	138 (14.0)
>50	57 (5.8)	32 (3.2)	89 (9.0)
<b>Marital Status</b>			
Single	221 (22.4)	124 (12.5)	345 (35.0)
Married	146 (14.8)	152 (15.4)	298 (30.2)
Co-habiting	91 (9.2)	96 (9.7)	187 (18.9)
Separated/ Divorced	110 (11.1)	48 (4.9)	158 (16.0)
<b>Educational Level</b>			
Non-formal	61 (6.2)	84 (8.5)	145 (14.7)
Primary School	212 (21.4)	76 (7.7)	288 (29.1)
Secondary	148 (15.0)	102 (10.3)	250 (25.3)
Vocational	79 (8.0)	52 (5.3)	131 (13.3)
Tertiary	68 (6.9)	106 (10.7)	174 (17.6)
<b>Residence</b>			
Urban	188 (19.0)	288 (29.2)	476 (48.2)
Rural	380 (38.5)	132 (13.3)	512 (51.8)
Total	568 (57.5)	420 (42.5)	988 (100.0)

**Table II:** Lifestyle Characteristics and Prevalence of Erectile Dysfunction (ed) among Respondents

Variable	Subjects			X <sup>2</sup>	P
	With ED n (%)	Without ED n(%)	TOTAL N(%)		
Use of Cigarette					
Currently smoking	228(23.1)	120(12.2)	348(35.3)	14.155	0.300
Smokes occasionally	162(16.4)	100(10.1)	262(26.5)		
Have stopped smoking	77(7.8)	104(10.5)	181(18.3)		
Never smoked before	101(10.2)	96(9.7)	197(19.9)		
Use of Alcohol					
Occasionally	164(16.6)	130 (13.1)	294 (29.8)	30.805	0.001
Always	99 (10.0)	84 (8.5)	183 (18.5)		
Never	305 (30.9)	206 (20.9)	511 (51.7)		

**Table III:** Showing Duration in (hours per day) of Motorcycling and Prevalence of Erectile Dysfunction(ed)

Variable	Subjects			X <sup>2</sup>	P
	With ED n (%)	Without ED n(%)	TOTAL N(%)		
Duration in hours per day					
1 - 5	276 (27.9)	210 (21.3)	486 (49.2)	18.839	0.001
6 - 10	213 (21.6)	114 (11.5)	327 (33.1)		
11 - 15	79 (8.0)	96 (9.7)	175 (17.7)		

**Degree of erectile dysfunction among respondents in the study:** One hundred and eighty-three (18.5%) respondents reported mild form of erectile dysfunction, while 146 (14.8%) respondents reported mild to moderate form. One hundred and twenty-nine (13.1%) respondents had moderate erectile dysfunction and 110 (11.1%) respondents reported severe form of the condition. The overall prevalence of all grades of erectile dysfunction identified in this study was 57.5%.

Table II shows the frequency of use of cigarettes and alcohol among respondents in the study. Three hundred and forty-eight (35.3%) respondents were currently smoking cigarettes, while two hundred and ninety-four (29.8%) respondents reportedly drank alcohol occasionally.

Table III shows the duration in hours per day engaged in motorcycling by the respondents. A total of 486 (49.2%) respondents engaged in motorcycle riding business from 1 to 5 hours per day. This class also had the highest number of those affected by erectile dysfunction: 276 (27.9%) respondents.

## DISCUSSION

The findings of this study show that erectile dysfunction is common among motorcyclists in Uyo, Nigeria. Its prevalence among this group of workers was 57.5%. This was made up of 18.5% mild ED, 14.8% mild to moderate, 13.1% moderate and 11.1% severe cases.

Previous studies have, however, reported different prevalence rates of ED among different population groups. The reported rates are: 57.4%<sup>10</sup>, 39.6%<sup>23</sup>, 43%<sup>31</sup> and 41.5%<sup>32</sup> respectively. Information on the true prevalence of ED in Nigeria will continue to be an estimate because of our cultural orientation regarding sexual matters.

The mean age of respondents with erectile dysfunction in this study was 31.10 years. This was at variance with reports from other workers who had shown that ED was more common among older men<sup>10,18,20</sup>. The high rate of ED in the younger age group may have been due to the high level of involvement of young men in this profession in this area.

In the present study, ED was seen to occur in 22.4% of single respondents compared to 14.8% of married respondents. Previous studies have also reported inconsistent results regarding the



effect of marital status on erectile dysfunction with some studies reporting an effect<sup>10,33</sup> that has not been confirmed in others<sup>34,35,36</sup>.

The inconsistencies reported by various authors, suggest that other factors not related to marital status may be implicated in the etiology of ED among single, married, co-habiting, separated or divorced persons. Such factors could include youthful exuberance among the unmarried which in some cases may lead to performance anxiety. Another factor may be stress arising from the challenges of early adulthood in our society. This is compounded by the taking on of excessive workload by working long hours to be able to provide for the family among the married, lack of time to engage in adequate foreplay during sexual meetings, concern about job security in this era of scarce job opportunities and the natural phenomenon of the ageing process<sup>16,17</sup>.

Also in this study, erectile dysfunction was more prevalent in respondents with Primary and Secondary School education and in those who reside in the rural areas. Education has commonly been used as an indicator of socio-economic status in population studies. Education and household income have been reported to be inversely related to erectile dysfunction by some workers<sup>18,20,33</sup>.

The effect of socio-economic status can partly be attributed to lifestyle factors. Higher socio-economic status is linked to better health and those who are better educated are less stressed physically and emotionally. On the other hand, low level of education is a major factor in the etiology of many non-diagnosed diseases, and low income is related to higher level of stress. Erectile dysfunction has also been reported to be higher among the unemployed and those earning low or no income at all<sup>10,20,32,34</sup>.

Another significant finding in this study was the engagement of those who have acquired tertiary Education in the motorcycling trade with attendant report of ED among them. There is therefore the need for serious re-appraisal of our priorities as a nation to forestall the unnecessary waste of trained man-power required for national development.

The differences in the prevalence of erectile dysfunction between those who reside in the rural areas and those who live in the urban areas may be attributable to the fact that those who live in the rural areas generally tend to have

lower levels of education and lower economic level.

Use of alcohol and other substances including cigarette are reportedly major risk factors for erectile dysfunction<sup>35,36,37,38</sup>. In this study, however, use of alcohol was not a significant finding among respondents with ED. The reason may be due to denial of alcohol use by operators for fear of possible reprimand, since the use of alcohol while driving is prohibited by law and is periodically emphasized by the umbrella Union of cyclists in the State as a safety measure to reduce the rate of road traffic accidents among operators. The number of hours spent per day riding the motorcycle was a significant finding among operators with erectile dysfunction in this study.

In motorcyclists, the cause of erectile dysfunction is believed to be associated with the compromise of blood supply to the penis. The compression and vibration by the saddle during motorcycling is reported to affect the perineal neurovasculature and cause erectile dysfunction<sup>26</sup>. Penile systolic pressure and tissue oxygen tension of the glands penis is reported to be reduced to about 60% of the baseline after sitting on the cycle saddle and recovers to normal after about 10 minutes of alighting from the cycle<sup>40</sup>. Erectile dysfunction in motorcyclists is also said to be associated with the saddle design. The saddle design having wide medium padded seat without saddle nose is reported to cause the least decrease in penile oxygen pressure as compared to the narrow heavily padded seat<sup>41</sup>.

In erectile dysfunction, plasma levels of endothelin-1 (ET-1) are elevated with associated reduction in growth hormone, nitric oxide and cyclic guanosine monophosphate (cGMP) in both systemic and cavernous blood<sup>42</sup>. The damage to perineal tissues caused by vibration during motorcycling may result in elevation of plasma levels of ET-1, and reduction in growth hormone, nitric oxide and cGMP in the cavernous blood<sup>43,44</sup>. It goes without saying therefore that exposure to prolonged vibration from motorcycling is a cause of erectile dysfunction, and the degree of vibration and length of use of the motor bike may account for the level of perineal injury and severity of erectile dysfunction.

### LIMITATIONS OF THE STUDY

The questionnaire used for this study was supposed to be a self-report diagnostic tool; its interpretation to some of the respondents may have reduced the accuracy of the responses given.

This study analyzed a population of motorcyclists who registered with the motorcyclist union and not all the operators since registration was not a mandatory requirement among operators in the first place. As a consequence, the result of this study should be considered as providing preliminary evidence for further studies and not be generalized to all motorcycle users.

### CONCLUSION

Although commercial motorcycling has been banned in many States in Nigeria because of the association of the riders with serious criminal activities and excessive intra-city road traffic accidents, there is, however, the need to carry out more studies to further validate the place of motorcycling in erectile dysfunction among private or non-commercial riders.

The prevalence of erectile dysfunction was high among motorcyclists in Uyo (57.5%). Despite this high prevalence, the sexual health of its operators was observed to receive very little attention in this locality.

It is concluded that motorcycle operators, physicians and policy makers need to know the inherent danger in motorcycle operation with respect to erectile dysfunction, with a view to working out appropriate intervention and prevention strategies in favor of the vulnerable groups.

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