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EVALUATION OF ERECTILE DYSFUNCTION AMONG BICYCLE TAXI(BODA BODA) RIDERS IN BUNGOMA TOWN, KENYA

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EVALUATION OF ERECTILE DYSFUNCTION AMONG BICYCLE TAXI (BODA BODA) RIDERS IN BUNGOMA TOWN, KENYA

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ABSTRACT

Background: Organic erectile dysfunction is common in elderly men but is not prevalent in men below 40 years of age. However, in addition to other known causes such as smoking, alcohol intake and diabetes mellitus, recent research has implicated bicycle riding as the cause of erectile dysfunction in much younger men. Even stationary bikes can cause trauma to the blood supply to the penis, resulting in Erectile Dysfunction.

Objective: To evaluate the effects of long term bicycle riding on erectile function among bicycle taxi (bodaboda) riders in Bungoma town.

Design: A cross-sectional comparative study.

Setting: Bungoma County, Kenya.

Subjects: Bicycle (boda boda) taxi riders in Bungoma Town

Results: A total of 230 participants were enrolled in this study of whom 115 were sugarcane cutters and 115 were bicycle taxi riders. The overall prevalence of erectile dysfunction among bicycle taxi riders was 35.9% and 34.0% among sugarcane cutters, was not significantly different. The period of riding in months was not significantly associated with erectile dysfunction among bicycle taxi riders but the length of riding in hours per week was significantly associated with erectile dysfunction $p < 0.01$. The risk of erectile dysfunction increased as the hours of riding per week increased. None of those who rode for more than 60 hours per week had a normal erectile function. The type of bicycle used was significantly associated with the quality of erection $p < 0.05$, hardness of erection score $p < 0.05$. Those who used mechanical (none motorised) bicycles had an increased risk for erectile dysfunction.

Conclusion: Longer hours of bicycle riding per week and use of non-motorised bicycles was associated with higher rates of erectile dysfunction among Boda boda taxi riders.

INTRODUCTION

Erectile dysfunction is a common condition that has affected men for centuries. Although it was considered a benign complaint, we now recognise that erectile dysfunction and sexual health have a profound impact on the overall health and quality of life of affected men and their spouses or partners (1).

Epidemiological studies show that the risk of erectile dysfunction increases with advancing age and that the typical patient with erectile dysfunction is generally in his 50s or 60s, there is increasing evidence, however that it also occurs in much younger men (2). It may be caused by psychological factors or hormonal

problems as well as chronic disease or acute injury (3).

Recently, there has been growing interest in the role of cycling in the development of erectile dysfunction particularly in young otherwise healthy men who lack the typical risk factors such as hypertension, elevated lipids, and cigarette smoking. Even stationary bikes can cause trauma to the blood supply to the penis, resulting in erectile dysfunction (4,5). Sexual intercourse is essential for both the physical and mental well being of an individual and marital stability (6).

In addition to being economical and efficient forms of transportation, cycling has become a

popular activity for relaxation, exercise and weight loss. The aerobic exercise required for biking has strong cardiovascular benefits and has also been shown to reduce the risk of diabetes and hypertension(7). The relationship between bicycle riding and erectile dysfunction has become a matter of concern.

Numerous case reports have been published of bicyclists with erectile difficulties and/or peroneal nerve dysfunction that resolves with changes in cycling techniques, rest or use of a softer saddle(8). Small observational studies have also shown relatively high prevalence of erectile dysfunction among elite cyclists who often reported penile numbness, and changes in sensation after cycling(3).

MATERIALS AND METHODS

This was a cross-sectional comparative survey determining the prevalence of erectile dysfunction among bicycle taxi riders in Bungoma County and Sugar cane cutters as comparison group.

Bungoma County is part of Western Kenya bordering Uganda to the west. Bodaboda (bicycle taxi) riding is thought to have started at Chebukube border point in Bungoma County during the coffee boom of early 1970s as a means of smuggling coffee into Kenya from Uganda. Now this mode of transport has become a major business among young men in Bungoma town. It is approximated that there are 1300 bodaboda taxi riders in Bungoma town.

Nzoia Sugar Company is also located in Bungoma County. It derives its manual laborers (sugar cane cutters) from within the county (on the outskirts of Bungoma town).

The study targeted bicycle taxi riders in five stations within the municipality (Kanduyi, Ntengelwa, Musikoma, Bus stage, Mandisini). The sugar cane cutters were interviewed at 5 stations Bukembe, Sirare, Mabanga, Nuclear, and Bulondo). The participants were aged below 40 years and married, were from low and lower middle socioeconomic status and were able to understand Luhya, Kiswahili and English languages.

A total of 230 participants were interviewed: 115 bicycle taxi riders and 115 sugar cane cutters. Simple

systematic sampling was used. Alternate taxi riders and sugar cane cutters were sampled in each of the town bases and given numbers to avoid repetition.

Participants were matched for age and duration of work. Using the prevalence ratio in the sample size, it was expected that 1 in 3 of the sugar cane cutters and 1 in 2 bicycle taxi riders has experienced ED in their life time during their work. Therefore in getting a sample of 228, at least 95 of them had experienced ED.

Data analysis was done using SPSS Version 16.0. Data was cleaned by running frequencies and missing values were checked and corrected by referring to questionnaires, descriptive statistics was carried out for both count variables (Age, duration of riding, or cutting sugarcane) and categorical variables. Measure of central tendency and dispersion were calculated for continuous variables. Some of the continuous variables were categorized to calculate proportions. Chi – Square test (Mantel-Haenssen summary Chi – Square test) was used to compare proportions and grouped variables. All significant variables in uni-variate analyses were analyzed by multivariate models to determine independent predictors of effect on erectile function.

EPI INFO 3.3.2 February 2005, was used to calculate odds ratio of the effect of alcohol intake and smoking on erectile function in the two study groups.

Significance was set at P Value = 0.05. Qualitative analysis was done thematically with some quotes of key informants. To assess the erectile function, the international index of erectile function questionnaire was used, validated by Rosen RC, Riley A, Wagner G, *et al.* The International Index of Erectile Function (IIEF): a multidimensional scale for assessment of erectile dysfunction.

RESULTS

A total of 230 participants were interviewed, the mean age for bicycle taxi riders was 27.69 years and 82.6 % of them were married and living with their spouses. The mean age of sugar cane cutters was 27.26 years and 99.1 % of them were married and living with spouse.

Table 1*Sociodemographic characteristics of the study population*

Characteristic	Frequency (%) Boda Boda(N=115)	Difference Cane Cutters(N=115)	P Value
Age in years			
≤28	71(61.7%)	61(53%)	
>28	44(38.2%)	54(47%)	
Age of spouse(years)			
≤25	63(54.8%)	68(59.1%)	0.52
>25	52(45.2%)	52(45.2%)	
Marital Status			
Cohabiting	1(0.9%)	0(0%)	0.874
Married	114(99.1%)	95(82.6%)	
Separated	9(7.8%)	1(0.9%)	
Devorced	7(6.1%)	0(0%)	
Widower	3(2.6%)	0(0%)	
Living with spouse			
Yes	102(88.7%)	110(95.7%)	0.862
No	13(11.3%)	5(4.3%)	
Have other partners?			
Yes	27(23.5%)	56(48.7%)	0.923
No	88(76.5%)	59(51.3%)	
Educational level			
≤Secondary school	100(87%)	104(90.4%)	0.932
>Secondary school	15(13%)	11(9.6%)	
Religion			
Christian	99(86.1%)	104(90.4%)	0.885
Non Christian	16(13.9%)	11(9.6%)	
Spouse Occupation			
Employed	7(6.1%)	6(5.2%)	0.929
Unemployed	108(93.9%)	109(94.7%)	
Length of Marriage			
≤ 4 Years	64(55.7%)	58(50.9%)	0.373
>4 Years	51(44.3%)	57(49.1%)	

There was no statistical difference in socio-demographic characteristics between bicycle taxi riders and the sugar cane cutters.

Table 2*Risk factor characteristics*

Characteristic	Frequency Boda Boda (N=115)	Difference Cane Cutters (N=115)	P Value
Taking Alcohol			
Yes	66(57.4%)	70(60.9%)	0.924
No	49(42.6%)	45(39.1%)	
Type Of Alcohol			
Bottled	13(18.6%)	8(10.4%)	0.914
Unbottled	57(81.4%)	69(89.6%)	
Quantity Taken			
<2Units	33(49.3%)	39(50.3%)	0.834
>2Units	37(50.7%)	38(49.7%)	
Frequency Of Taking Alcohol			
Daily	25(39.2%)	20(26%)	0.743
Occasionally	45(60.8%)	57(74%)	
Smoking			
Yes	32(27.8%)	33(28.7%)	0.913
No	83(72.2%)	82(71.3%)	
Type Smoked			
Cigarettes	30(85.7%)	31(83.8%)	0.823
Others	5(14.3%)	6(16.2%)	

There was no statistically significant difference in the intake of alcohol or smoking habits of both BodaBoda riders and sugarcane cutters.

Majority of Bodaboda riders used non-motorised bicycles. Majority of the bodaboda riders (78.26 %) used padded seat bicycles. Hours of working per week (riding/cutting sugarcane) Majority of Bodaboda riders worked for longer hours per week (>40 hours), than sugar cane cutters.

Table 3*Comparison of rates of erectile dysfunction between Bodaboda riders and cane cutters*

Overall Erectile function score	Boda boda(n=115)	Frequency (%)	P value	O d d s Ratio	C. (95%)
6-10(severe dysfunction)	7(6.1%)	8(7.0%)	0.787	0.87	0.27-2.75
11-16(moderate dysfunction)	34(29.6%)	31(27.0%)	0.660	1.14	0.62-2.10
17-21(mild –moderate dysfunction)	38(33.0%)	32(27.8%)	0.390	1.28	0.70-2.34
22-25(mild dysfunction)	18(15.7%)	19(16.5%)	0.858	0.94	0.44-2.00
26-30(normal function)	18(15.7%)	25(21.7%)	0.237	0.67	0.32-1.37

There was no significant difference in the rates of erectile dysfunction between Bodaboda riders and cane cutters.

Table 4
Correlation of overall erectile function score and risk factors among Bodaboda riders

	Score	6-10 severe dysfunction	11-16 moderate dysfunction	17-21 mild/moderate dysfunction	22-25 mild dysfunction	26-30 normal function	P value
Age	≤28	5(71.4%)	19(55.9%)	23(60.5%)	11(61.1%)	13(72.2%)	0.802
	>28	2(28.6%)	15(44.1%)	15(39.5%)	7(38.9%)	5(27.8%)	
Alcohol intake	Yes	4(57.1%)	20(58.8%)	20(52.6%)	12(66.7%)	10(55.6%)	0.904
	No	3(42.9%)	14(41.2%)	18(47.4%)	6(33.3%)	8(44.4%)	
Smoking	Yes	3(42.9%)	9(26.3%)	10(26.3%)	5(27.8%)	5(27.8%)	0.930
	No	4(57.1%)	25(73.5%)	28(73.7%)	13(72.2%)	13(72.2%)	
Period of riding in months	0-9	1(14.3%)	14(41.2%)	9(23.7%)	3(16.7%)	5(27.8%)	0.094
	10-19	5(71.4%)	16(43.1%)	25(65.8%)	7(38.9%)	7(38.9%)	
	20-29	1(14.3%)	3(8.8%)	3(7.9%)	5(27.8%)	5(27.8%)	
	≥30	0(0%)	1(2.9%)	1(2.6%)	3(16.7%)	1(5.6%)	
Length of riding in hours/week	0-19	0(0%)	0(0%)	1(2.6%)	4(22.2%)	1(5.6%)	0.000
	20-39	3(42.9%)	13(38.2%)	22(57.9%)	8(44.4%)	13(72.2%)	
	40-59	2(28.6%)	9(26.5%)	4(10.5%)	6(33.3%)	4(22.2%)	
	≥60	2(28.6%)	12(35.3%)	11(28.9%)	0(0%)	0(0%)	
Type of bicycle used	Mechanical	4(57.1%)	23(67.6%)	29(76.3%)	11(61.1%)	18(100%)	0.084
	Motorised	3(42.9%)	7(20.6%)	4(22.2%)	4(22.2%)	0(0%)	
	Both	0(0%)	4(11.8%)	5(13.2%)	3(16.7%)	0(0%)	
Type of bicycle seat/saddle used	Padded	5(71.4%)	26(76.5%)	28(73.7%)	15(83.3%)	16(88.9%)	0.890
	Unpadded	1(14.3%)	2(5.9%)	4(10.5%)	1(5.6%)	0(0%)	
	Chair	1(14.3%)	6(17.6%)	6(15.8%)	2(11.1%)	2(11.1%)	

Longer hours of ridding per week were significantly associated with severe erectile dysfunction.

Table 5
Correlation of overall quality of erection category and risk factors for bodaboda riders

		Severe ED	Normal	P value
Age	≤28	28(68.3%)	43(58.1%)	0.282
	>28	13(31.7%)	31(41.9%)	
Alcohol	Yes	23(56.1%)	43(58.1%)	0.835
	No	18(43.9%)	31(41.9%)	
Smoking	Yes	11(26.8%)	21(28.4%)	0.859
	No	30(73.2%)	53(71.6%)	
Period of riding in months	0-9	14(34.1%)	18(24.3%)	0.718
	10-19	19(46.3%)	41(55.4%)	
	20-29	6(14.6%)	11(14.9%)	
	30	2(4.9%)	4(5.4%)	
Length of riding in Hours/week	0-19	0(0%)	6(8.1%)	0.224
	20-39	20(48.8%)	39(52.7%)	
	40-59	10(24.4%)	15(20.3%)	
	≥60	11(26.8%)	14(18.9%)	
Type of bicycle used	Mechanical	25(61.0%)	60(81.1%)	0.046
	Motorised	10(24.4%)	8(10.8%)	
	Both	6(14.6%)	6(8.1%)	
Type of bicycle seat saddle used	Padded	29(70.7%)	61(82.4%)	0.342
	Unpadded	4(9.8%)	4(5.4%)	
	Chair	8(19.5%)	9(12.2%)	

Non-motorised bicycles were significantly associated with severe erectile dysfunction.

Table 6
Correlation of hardness of erection score and risk factors

	Score	0	1	2	3	4	P value
Age	≤28	1(100%)	6(85.7%)	10(55.6%)	6(60%)	48(60.8%)	0.616
	>28	0(0%)	1(14.3%)	8(44.4%)	4(40%)	31(39.2%)	
Alcohol	Yes	1(100%)	2(28.6%)	9(50%)	9(90%)	45(57.0%)	0.096
	No	0(0%)	5(71.4%)	9(50%)	1(10%)	34(43.0%)	
Smoking	Yes	0(0%)	0(0%)	5(27.8%)	3(30%)	24(30.4%)	0.499
	No	1(100%)	7(100%)	13(72.2%)	7(70%)	55(69.6%)	
Period of riding in months	0-9	1(100%)	2(28.6%)	6(33.3%)	1(10%)	22(27.8%)	0.767
	10-19	0(0%)	3(42.9%)	8(44.4%)	7(70%)	42(53.2%)	
	20-29	0(0%)	1(14.3%)	4(22.2%)	1(10%)	11(13.9%)	
	≥30	0(0%)	1(14.3%)	0(0%)	1(10%)	4(5.1%)	
Length of riding in hours/week	0-19	0(0%)	0(0%)	0(0%)	1(10%)	5(6.3%)	0.525
	20-39	0(0%)	2(28.6%)	10(55.6%)	6(60%)	41(51.9%)	
	40-59	1(100%)	2(28.6%)	2(11.1%)	2(20%)	18(22.8%)	
	≥60	0(0%)	3(42.9%)	6(33.3%)	1(10%)	15(19%)	
Type of bicycle used	Mechanical	1(100%)	6(100%)	12(66.7%)	6(60%)	60(75.9%)	0.05
	Motorised	0(0%)	0(0%)	5(27.8%)	0(0%)	13(16.5%)	
	Both	0(0%)	0(0%)	1(5.6%)	4(40%)	6(7.6%)	
Type of bicycle seat saddle used	Padded	0(0%)	5(71.4%)	13(72.2%)	9(90%)	63(79.7%)	0.146
	Unpadded	1(100%)	1(14.3%)	2(11.1%)	0(0%)	13(16.5%)	
	Chair	0(0%)	1(14.3%)	3(16.7%)	1(10%)	3(3.8%)	

Non-motorised bicycles were significantly associated with poor erectile hardness score.

Table 7
Correlation of sexual characteristics and overall quality of erection among bodaboda riders

Characteristic		Severe ED	Normal	P Value
Level of sexual desire	low	27(23.5%)	13(11.3%)	0.000
	high	14(12.2%)	61(53.1%)	
Overall satisfaction with sex life	Very dissatisfied	23(20.0%)	19(16.5%)	0.006
	Satisfied	18(15.6%)	55(47.8%)	
Satisfactory sexual relationship with spouse	Very dissatisfied	23(20.0%)	7(6.1%)	0.000
	Satisfied	18(15.6%)	67(53.1%)	

There was significant association between the level of sexual desire, the overall satisfaction with sex life and satisfactory sexual relationship with spouse, with the overall quality of erection among bodaboda riders.

Table 8
Correlation of sexual characteristics and hardness of erection score among bodaboda riders

Characteristic	Score	0	1	2	3	4	P value
Level of sexual desire	low	1(0.9%)	7(6.1%)	11(9.5%)	4(3.5%)	17(14.8%)	0.000
	high	0(0%)	0(0%)	7(6.0%)	6(6.2%)	62(63.5%)	
Overall satisfaction with sex life	Very dissatisfied	1(0.9%)	5(4.4%)	10(8.7%)	4(3.5%)	22(18.7%)	0.006
	satisfied	0(0%)	2(1.8%)	8(6.9%)	6(6.2%)	57(49.6%)	
Satisfactory sexual relationship with spouse	Very dissatisfied	1(0.9%)	5(4.8%)	8(6.9%)	3(2.6%)	13(11.3%)	0.000
	Satisfied	0(0%)	2(1.8%)	10(8.7%)	7(6.0%)	66(57.4%)	

Higher erectile hardness scores were associated with higher levels of sexual desire, overall satisfaction with sex life and satisfactory sexual relationship with spouse.

DISCUSSION

This was a cross-sectional comparative study evaluating the effect of long term Bicycle (boda boda) riding on erectile function and comparing the prevalence of erectile dysfunction between the bicycle taxi riders and sugar cane cutters in Bungoma town, the sample size was 230 participants.

The study groups had comparable age, age of their spouses and marital status except for one bicycle taxi rider who was cohabiting, nine were separated, seven divorced and three Widower.

Majority lived with their spouses, those who had other sexual partners had a significant association with erectile function, the overall quality of erection and the hardness of erection score. There was significant difference among boda boda riders with other sexual partners and those without other spouses in; erectile function $p < 0.05$, overall quality of erection $p < 0.05$, Hardness of erection score $p < 0.05$.

Having other sexual partners was associated with increased risk of erectile dysfunction.

In their study, among the Ariat of northern Kenya, 2002, (9). P Gary and coworkers, showed a significant relationship between the number of spouses and erectile dysfunction ($p < 0.05$), there was increased reporting of erectile dysfunction among men with multiple spouses.

Bicycle taxi riders (boda boda), who had other occupations had a significant difference with those doing only boda boda business in terms of; erectile function $p < 0.05$ with having other occupation being associated with higher risk of erectile dysfunction. However there was no significant difference in terms of quality of erection and hardness of erection.

Taking alcohol or smoking was not significantly associated with erectile dysfunction. However, E Oksuz and colleagues (10), 2005, found alcohol intake and smoking as the most important risk factors for erectile dysfunction. The type of bicycle used was significantly associated with the quality of erection $p < 0.05$, hardness of erection score $p < 0.05$. Those who used mechanical (none motorised) bicycles

had an increased risk of erectile dysfunction. This may be attributed to increased compression of perineal vessels and nerves predisposed by riding mechanical bicycles. In their study Dettori JR and colleagues (11), showed association between bicycle characteristics and risk of erectile dysfunction, with prevalence higher in mechanical bikes. Those who rode non-motorised bicycle expressed concern about the weakness of their sex organ. One of them had the following comment "It is stressful physically and reduces sexual performance" There was no significant association between erectile function, quality of erection and the hardness of erection with the type of saddle seat used on the bicycle. Taylor JA et al (12), 2004, found that measures thought to

reduce the risk of erectile dysfunction - like padded saddle seats, padded shorts elongated "aerobar" handles- didn't work.

The overall prevalence of erectile dysfunction among boda boda riders based on international index of erectile function score was 35.7%, which corresponds to the findings in; Sexual dysfunction in the U.S survey; prevalence and predictors of 31% (4). The study by E Oksuz and colleagues (10), 2005, showed a prevalence of erectile dysfunction of 33% among Turkish men aged 20 - 40 years. The period of riding in months was not significantly associated with erectile dysfunction, but there was a strongly significant association between the length of riding in hours per week and the erectile function $p < 0.01$. The risk of erectile dysfunction increased as the length of riding increased. None of those who rode more than 60 hours a week had normal erectile function.

In a study of erectile dysfunction after long distance cycling (XX), (Joseph R. and colleagues, 2004) showed 31% prevalence of erectile dysfunction among 463 cyclists (RR 4.4 95% CI 1.6-2.7). Most recommended that those entering into the boda boda business should minimize the number of hours they ride daily in order to maintain their sexual function. Asked why, one commented that, "I have separated twice due my inability to perform since I started this business" The lack of association between period of riding and erectile dysfunction may have been due to intermittent breaks taken by the boda boda riders from this business allowing recovery from exhaustion and perineal injuries from the bicycle seats. In their study Joseph R and colleagues (XX) also found the cumulative incidence of erectile dysfunction reduced as the duration of rest from riding increased.

The overall prevalence of erectile dysfunction among the sugar cane cutters was 34.0%, which is not significantly different from the Boda boda riders, Taylor, J.A. et al (12) in 2004 showed that overall prevalence of erectile dysfunction in the cycling community did not appear to be greater than in the general population. There was a strong association between erectile function and the length of cutting sugarcane in hours per week $p < 0.01$. Those who cut for more than 60 hours per week had the highest risk of having erectile dysfunction.

The level of sexual desire among Boda Boda riders was significantly associated with; erectile function $p < 0.01$, the quality of erection $p < 0.01$. Those with low erectile function scores and poor quality of erection among the Boda boda riders had very low levels of sexual desire. The overall satisfaction with sex life of Boda boda riders had significant association with erectile function score $p < 0.01$, the quality of erection $P < 0.01$ and the hardness of erection scores $p < 0.01$. Those with low scores were very dissatisfied with their sex life. Satisfactory sexual relationship with the partners of Boda boda riders was strongly associated

with; the erectile function score $P < 0.01$, the quality of erection $P < 0.01$, and the hardness of erection score $p < 0.01$. Those with low erectile function score were very dissatisfied with their sexual relationship. N. Schlimmer and colleagues (11), (2008), demonstrated significant relationships between levels of sexual desire, intercourse satisfaction, satisfactory sexual relationships with the erectile function score, quality of erection and erection hardness score ($p > 0.05$)

Majority of those with erectile dysfunction (41 boda boda riders) only 13(31.7%) had sought treatment, with 84.6% seeking treatment from local herbalist and 15.4% had been attended by a general practitioner. All those sought treatment at herbalist were given herbal medicine and none was referred for specialised care. During the study 81 participants were referred to urologists in Moi Teaching and Referral Hospital. Both were from the boda boda and sugarcane cutters groups. Omar Egesah and colleagues(14), 2005, found that most men in Bungoma district sought traditional herbal remedies for both sexually related ailments and circumcision due to cultural believes and cost of treatment.

In conclusion, longer hours of bicycle riding per week were associated with greater risk of erectile dysfunction . Non-motorised bicycles were significantly associated with erectile dysfunction.

The overall risk of erectile dysfunction among boda boda riders was not significantly different from that among sugar cane cutters.

Higher scores of erectile function, quality of erection and the erection hardness score were significant predictors of sexual desire, overall satisfaction with sexual life and satisfactory sexual relationships with spouses among the boda boda riders.

Majority of boda boda riders with erectile dysfunction consulted local herbalists and received herbal treatment.

We recommended that; Promotion of the use of motorised bicycle taxis should encouraged. However larger studies need to be done to conclusively show the association between mechanical bicycles and erectile dysfunction. Bicycle riders should be counseled to work for less hours and rest more to decrease the risk of erectile dysfunction and increase marital sexual satisfaction. Local health personnel should

be educated on the risk factors and management of erectile dysfunction.

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