FREQUENCY AND RISK FACTORS OF ERECTILE DYSFUNCTION IN PATIENTS WITH DIABETES MELLITUS

Muhammad Bilal Khattak[1], Zahid Irfan Marwat[2], Sajjad Ali[3]

ABSTRACT

Objective: To determine the frequency, severity and risk factors of erectile dysfunction in patients with diabetes mellitus.

Materials and methods: In this descriptive cross sectional study male patient with type II diabetes mellitus were included (age 25 to 75 years) visiting Department of Medicine Lady Reading Hospital Peshawar. Participants completed a self-reported questionnaire on demographic, socioeconomic, lifestyle characteristics and on erectile function, using the IIEF-15 (International Index of Erectile Function). Information on duration of diabetes, smoking, type of treatment, dyslipidemia, coronary artery disease, kidney disease and blood pressure were also obtained.

Results: The study included 146 diabetic male patients. Their age ranged between 25 and 75 with a mean of 52.75 and standard deviation of 10.367 years. The overall frequency of ED was 65.1%. Among the 95 patients with ED, it was mild in 10 (6.8 %), moderate in 15 (10.3%), moderate in 38 (26 %) and severe 32 (21.9 %) patients. Only 51 patients (34.9 %) have no erectile function. Patient`s age, DM duration, hypertension, hyperlipidemia, smoking, history of coronary artery and kidney disease were independently associated with ED among diabetic patients (p <0.05).

Conclusion: Erectile dysfunction is a common condition in diabetic men and the severity increases with age and duration of diabetes. This study provides a quantitative estimate of the frequency of erectile dysfunction and its main risk factors in diabetic patient and therefore should routinely be inquired by the clinicians.

KEY WORDS: Diabetes mellitus, erectile dysfunction, severity.

INTRODUCTION

Diabetes mellitus (DM) is a chronic disease involving multiple systems of the body. In Pakistan DM has a high prevalence and is estimated to be 23.7% and it still raising.[1] Complications of DM are multiple but one of the common complication of DM which is neglected and often not inquired about is the Erectile Dysfunction (ED).[2]

ED is defined as the persistent inability to achieve and /or maintain erection of sufficient rigidity to have satisfying sexual activity.[3] Diabetes mellitus induced erectile dysfunction (DMED) is multifactorial in etiology including vascular, neurological, endocrinological and psychological components.[4] DM can interfere with all these mechanisms as diabetics are prone to the development of microangiopathic complications, neuropathy, hypogonadotropic hypogonadism and depression associated with this chronic disease which explains why ED is a common complication of DM.[5]

[1] Department of Medicine, LRH, Peshawar,
[2] Department of Biochemistry Ayub Medical College Abbottabad,
[3] Department of Pulmonology LRH Peshawar

....

Address for correspondence:
Dr. Muhammad Bilal Khattak
Senior Registrar, Medical A Unit, Hayatabad Medical Complex, Peshawar
E-mail:bilal_amc1@yahoo.com
Mob:0333-9346838

If not properly investigated and treated, ED can poorly affect the patient quality of life in many aspects. Sexual health is an important determinant of an individual's over all physical and emotional well being.[6] It does not directly affect life expectancy but can have a strong negative effect on the well being and quality of his and his partner's life, as it often leads to various psychiatric and social problems. One study reported that about 86.1% of diabetic patients have variable degree of erectile dysfunction in Pakistan.[7] Most of the diabetic patients with ED are usually distressed by this problem but they usually hesitate to discuss this issue with their physician and want them to initiate this discussion.[8] Studies show that unfortunately only small percentage of doctors asks about ED during their care of diabetic patients.[9]

The doctors come across and care many diabetic patients in regular and short interval in hospitals which give the doctors the priority and responsibility to discuss ED in a proper way with their patients. Despite the limitation of diagnostic and therapeutic facilities, the doctors hold a responsible position in the management of diabetics regarding ED. Detailed history and full physical exam can give a clue for the diagnosis and further management of ED. Along with good control of the DM, hypertension, hyperlipidemia and smoking can prevent or halt the progression of ED.[10] Diagnosis and management of depression and anxiety in diabetics, which is considered an important factor in ED DM, can be done.[11] Increase in physical activity can decrease the risk of ED which should be emphasized by primary

care doctor.[12]

Because the presence of ED can give important information such as a silent and masked cardiovascular disease and also can predict future risk.[13] Therefore the presence of ED is considered an indication to check for diabetic complication caused by microangiopathy in target organs such as retinopathy. ED can be the presenting symptom of DM and a patient who develops ED is two times more likely to have DM than a patient with no ED. [14]

Based on the results of this study policy recommendations can be suggested at primary health care level to improve the care of the patients with DM by properly and timely treating the ED and also to detect and manage other complications to improve the quality of life of these patients.

MATERIAL AND METHODS

In this study a sample of 146 of male patient with type II diabetes mellitus were included (age 25 to 75 years) visiting Department of Medicine Lady Reading Hospital Peshawar. Participants completed a self-reported questionnaire on demographic, socioeconomic, lifestyle characteristics and on erectile function, using the IIEF-15 (International Index of Erectile Function). Information on duration of diabetes, smoking, type of treatment, dyslipidemia, coronary artery disease, kidney disease and blood pressure were also obtained

Patients were explained the purpose, the procedure and the risk / benefit of the study and written consent were taken about study. Approval from ethical committee was obtained prior to the data collection. Confidentiality of information was assured. In complete privacy, patients were interviewed and screened for erectile dysfunction by using the International Index of Erectile Function 5 (IIEF-5) questionnaire. A questionnaire was developed to use for data collection. The socio-demographic data including age occupation, marital status as well as history of smoking were also recorded. Medical history including type, duration and treatment for diabetes, history of hypertension history of medication and other associated illness was also noted. General physical examination like pulse, blood pressure, and weight and height measurement for calculation of body mass index (BMI) was also done. Body Mass Index of less than 25 was taken as normal, 25.1 to 27 was taken as overweight and greater than 27 was considered as obesity.

RESULTS

This study was conducted in Department of Medicine, Lady Reading Hospital Peshawar from November 2012 onward. Results of the study are summarized as under:

Our study included 146 male patients with type II diabetes mellitus. The age of the sample population ranged between 25 and 75 with a mean of 52.75 and standard deviation of 10.367 years. Most common age group was 51-60 years including 53 patients, followed by age group 41-50 years with 37 patients (Table 1).

Graph 1 demonstrates that the overall prevalence of ED in the study was 65.1%. Among the 95 patients with ED, it was defined as mild in 10 (6.8 %), moderate in 15 (10.3%), moderate in 38 (26 %) and severe 32(21.9 %) patients. Only 51 patients (34.9 %) have no erectile function (Graph 1).

The results of this study showed that the prevalence of ED increased with increasing age of patients. 97 % Patients aged > 60 years had ED compared to 18.2% of those aged ≤ 40 years. The prevalence of severe ED ranged from 50.0% in patients aged > 60 years, down to 24.5 % in patients aged ≤ 60 years. These differences were statistically significant (P=<0.001) (Table 2).

The study results showed that most patients were educated. Education level of 89 patients (61.0 %) were above matric. Only 19 patients (13 %) were illiterate. However the frequency of ED did not significantly associated with patient`s education. 58 patients with above matric level of education had ED (65.2%) compared to 64.3 % of those with education level below matric. The prevalence of severe ED ranged from 20.8 % in patients with matric level education up to 24.7 % in patients with above matric level of education. However, these differences were not statistically significant (P=0.495) (Table 3).

The income of most respondents (60 patients) in the study was in the range of 7000-15000 Saudi riyals per month. Only 42 patients had income below 7000 per month. The prevalence of ED did not significantly associated with patient`s income. 57.9 % patients with income < 7000 Saudi Riyals / month have ED compared to 64.3 % of those with income >15000 Saudi Riyals per month. The prevalence of severe ED ranged from 23.3 % in patients with income of 7000-15000 Saudi Riyals / month up to 27.3% in patients with income >15000 SR/month. These differences were not statistically significant (P=0.449) (Table 4).

The study results show that the prevalence of ED was higher among ex-smokers and smokers than non-smokers. 80.0 % of ex-smokers and 75.9 % of current smokers have ED compared to 47.7% of non-smokers. The prevalence of severe ED was 12.3% among nonsmokers compared to 26.9 % and 34.5 % among ex-smokers current smokers, respectively. These differences were statistically significant (P=<0.012) (Table 5).

The results of the study showed that the frequency of ED increased with the duration of DM. The proportion of ED ranged from 31.0 % for DM lasting ≤ 5 years to 96.6 0% for DM of >15 years. Data analysis showed that patients with ED had a longer duration of DM than those without ED (P < 0.001). Moreover severity of erectile dysfunction also increased with the duration of DM (P

Table No. 1: Age-Wise Distribution of the Diabetic Patients (n=146)

Age of the patients	No. of patients	Min	Max	Mean	Std. Deviation
Age (years)	146	25	75	52.75	10.367
Age groups	No.	40 or less	41-50	51-60	60 or More
No. of patients	146	22	37	53	34
% of patients	100 %	15.1	25.3	36.3	23.3

Table 2: Severity of Erectile Dysfunction (Ed) by Age Groups of Diabetic Patients (n=146)

Age groups	No. (%) With no ED (22-25)	No. (%) With ED	Severity of erectile dysfunction, No. (%)				Total No. (%)
			Mild (17-21)	Mild to moderate (12-16)	Moderate (8-11)	Severe (1-7)	
40 or <	18 (81.8)	4 (18.2)	0 (0)	4 (18.2)	0 (0)	0 (0)	22 (100)
41-50	20 (54.1)	17 (45.9)	5(13.5)	8 (21.6)	2 (5.4)	2 (5.4)	37 (100)
51-60	12 (22.6)	41 (77.4)	5 (9.4)	2 (3.8)	21 (39.6)	13(24.5)	53 (100)
> 60	1 (2.9)	33 (97.1)	0 (0)	1 (2.9)	15 (44.1)	17 (50)	34 (100)
Total	51 (34.9)	95 (65.1)	10(6.8)	15 (10.3)	38 (26)	32(21.9)	146 (100)
Chi square	88.29						
P= value	0001						

Table 3: Severity of Erectile Dysfunction (Ed) by Education Level of Diabetic Patients (n=146)

Education level	No. (%) With no ED (22-25)	No. (%) With ED	Severity of erectile dysfunction, No. (%)				Total No. (%)
			Mild (17-21)	Mild to moderate (12-16)	Moderate (8-11)	Severe (1-7)	
Illiterate	8 (42.1)	11 (57.9)	1 (5.3)	1 (5.3)	5 (26.3)	4 (21.1)	19 (100)
Under ma-tric	7 (29.2)	17 (70.8)	3 (12.5)	2 (8.3)	7 (29.2)	5 (20.8)	24 (100)
Matric	5 (35.7)	9 (64.3)	2 (14.3)	4 (28.6)	2 (14.3)	1 (7.1)	14 (100)
Higher	31 (34.8)	58 (65.2)	4 (4.5)	8 (9.0)	24 (27.0)	22 (24.7)	89 (100)
Total	51 (34.9)	95 (65.1)	10 (6.8)	15 (10.3)	38 (26)	32(21.9)	146(100)
Chi square	11.40						
P= value	0.495						

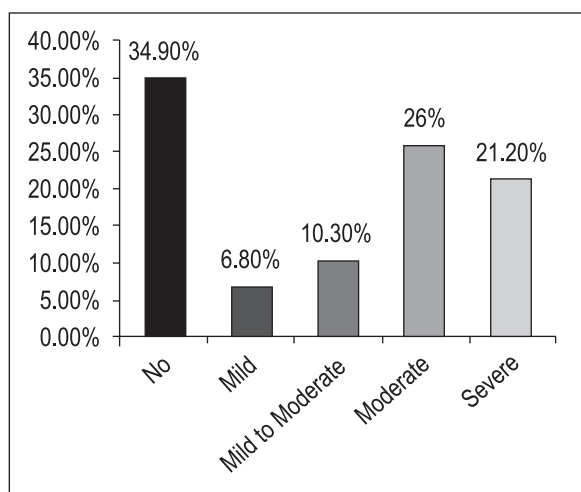**Table 4: Severity of Erectile Dysfunction (Ed) by Income of Diabetic Patients (N=146)**

Income in Pak Rs / month	No. (%) With no ED (22-25)	No. (%) With ED	Severity of erectile dysfunction, No. (%)				Total No. (%)
			Mild (17-21)	Mild to moderate (12-16)	Moderate (8-11)	Severe (1-7)	
< 7000	11 (26.2)	11 (57.9)	4 (9.5)	6 (14.3)	15 (35.7)	6 (14.3)	42 (100)
7000-15000	25 (41.7)	17 (70.8)	4 (6.7)	4 (6.7)	13 (21.7)	14(23.3)	60 (100)
>15000	15 (34.1)	9 (64.3)	2 (4.5)	5 (11.4)	10 922.7)	12 (27.3)	44 (100)
Total	51 (34.9)	95 (65.1)	10 (6.8)	15 (10.3)	38 (26)	32(21.9)	146 (100)
Chi square	7.841						
P= value	0.449						

Table 5: Severity of Erectile Dysfunction (Ed) by History of Smoking Among Diabetic Patients (N=146)

Smoking status	No. (%) With no ED (22-25)	No. (%) With ED	Severity of erectile dysfunction, No. (%)				Total No. (%)
			Mild (17-21)	Mild to moderate (12-16)	Moderate (8-11)	Severe (1-7)	
Never smoker	34 (52.3)	31 (47.7)	4 (6.2)	6 (9.2)	13 (20.0)	8 (12.3)	65(100)
Ex-smoker	10 (19.2)	42 (80.8)	3 (5.8)	7 (13.5)	18 (34.6)	14 (26.9)	52 (100)
Active smoker	7 (24.1)	22 (75.9)	3(10.3)	2 (6.9)	7 (24.1)	10 (34.5)	29 (100)
Total	51 (34.9)	95 (65.1)	10(6.8)	15 (10.3)	38 (26)	32(21.9)	146 (100)
Chi square	19.655						
P= value	0.012						

Table 6: Severity of Erectile Dysfunction (Ed) by Duration of Dm Among Diabetic Patients (N=146)

Duration of DM (years)	Severity of ED. No. %					Total No. %
	NO ED. (22-25) No. %	Mild. (17-21)	Mild to Moderate. (12-16)	Moderate (8-11)	Severe (1-7)	
5 or less	29(69.0%)	3(7.1%)	7(16.7%)	3(7.1%)	0(.0%)	42(100.0%)
6-10	16(39.0%)	4 (9.8%)	6(14.6%)	6(14.6%)	9(22.0%)	41(100.0%)
11-15	5(14.7%)	3(8.8%)	0(.0%)	16(47.1%)	10(29.4%)	34(100.0%)
>15	1(3.4%)	0(.0%)	2(6.9%)	13(44.8%)	13(44.8%)	29(100.0%)
Total	51(34.9%)	10(6.8%)	15(10.3%)	38(26.0%)	32(21.9%)	146(100.0%)
Chi square	69.875					
P=value	0.001					

Graph 1: Frequency of Erectile Dysfunction Among Diabetic Patients (N=146)

< 0.001). The percentage of patients with severe ED increased from 0.0% among those who had DM for ≤5 years to 44.8 % among patients who had DM for >15 years (Table 6).

DISCUSSION

Diabetes mellitus induced erectile dysfunction (DMED) is multifactorial in etiology including vascular, neurological, endocrinological and psychological components. The current study aimed at exploring the prevalence of erectile dysfunction (ED) among type II diabetic men and its associated risk factors.

Various studies across the globe have reported a wide range of prevalence rates of ED among diabetic men. In this study, the frequency of erectile dysfunction in diabetic patients was 65 % which correlates well with the reported prevalence rates of 61-67%, conducted in Western [8,17] and Arab countries.[7] However, it is higher than the rate reported by some previous studies (48-60%).[18,19]

The differences in the prevalence rates can be explained by differences in the populations studied, the methods used and the research instruments. Additionally, the introduction of effective oral treatment has increased the awareness toward ED, which might explain the higher rates reported in the recent studies as compared with other studies.[20] More over collecting data by self-administered questionnaires can lead to different results. Underreporting and a lower response rate are expected if a self-administered questionnaire is used, especially when dealing with a sensitive issue such as ED. Furthermore, in our cultures, erection is associated with the concept of manhood; therefore,

some patients with ED denied the disease.[21]

The current study showed that prevalence and severity of ED increase significantly and progressively with age, as reflected by the higher prevalence of overall ED and severe ED as age advances. This reported association between age and ED confirms what has been shown in other studies.[17,22] Recently Rami et al also has shown a positive relationship between the increasing age and severity of ED.[21]

However, ED should not be considered as an inevitable outcome of older age. Among our patients, 22% in the age groups 51-60 years had no ED. It may result from the lack of interest in sex or having no opportunity for sexual activity rather than ED per se. [23]

Data analysis showed that the frequency and severity of ED increases as the duration of DM since diagnosis increases. This finding is in agreement with other studies, showing that the duration of DM was an independent risk factor for ED[16] However, contrary to that, a Jordian study concluded that duration of diabetes was not a risk factor for ED.[17] In his study this might reflect a strong association between duration and other independent risk factors of ED, particularly age, which resulted in excluding it from the multivariate logistic model.

Diabetes is a chronic metabolic disorder with many complications and associated factors that will predispose to erectile problems including psychological stresses of living with diabetes; penile disorders, namely Balanitis, phimosis, Peyronies disease, etc.; premature aging (degeneration) of the corpora cavernosal and other penile tissues.; metabolic abnormalities: hyperglycemia, excessive protein glycosylation; sensory and autonomic neuropathy; microvascular disease; macrovascular disease; hypertension and antihypertensive drugs. This association is likely to intensify as lower targets for blood pressure control and more intensive drug regimens are used, and other associated endocrine disorders. These factors improved with age and duration of diabetes.[21,24]

Although we have shown a positive relationship between smoking and ED but this is a controversial issue. As many epidemiological and experimental studies have shown a significant association,[22] this was not evident in other studies.[25,26] In diabetic patients, similar discrepancies regarding the association between smoking and ED exist in the literature, a number of studies did not confirm this association.[16,17]

In this study, current smoking was not associated with a higher prevalence of ED. However, ex-smokers were observed to have a significantly higher prevalence of ED compared with nonsmokers in the data analysis. Apparently, many ex-smokers quit smoking after they had suffered from its morbid sequele. This study clearly shows the association between diabetic complications such as nephropathy, coronary artery diseases and the

prevalence and severity of ED, which has been shown in other studies. This finding reflects the bad effect of poor glycaemic control. [21,27]

In our culture, discussing sexual problems may be viewed as an embarrassing discussion for the doctor or his patient but, not by the majority when carried out properly. It is the responsibility of the doctor, as a health care provider, to ensure that his diabetic patient has the chance to address this problem and receive treatment for it, if needed.

CONCLUSION

Sexual problems are not commonly discussed in this country because of cultural and social barriers. Both patients as well as doctors consider it as an embarrassing discussion. Erectile dysfunction is a very common condition in diabetic men and therefore should be routinely sought for by the clinicians. This study provides a quantitative estimate of the frequency of erectile dysfunction and its main risk factors in diabetic patients. All male diabetic patients should be asked/ evaluated about this complication like other complication on visits because ED is an independent risk factor & predictor of future major cardiovascular events. If and when detected earlier, further evaluation and management options can be considered and offered to the patients in order to improve their quality of life.

REFERENCES

1. I-Nozha MM et al (2004). Diabetes mellitus in Saudi Arabia. Saudi Med J 25(11):1603-10.

2. Berraho M, Benslimane A, Chrit M, El HH, Lyoussi B (2008). Diabetes and erectile dysfunction in Morocco: epidemiological study among outpatients. East Mediterr Health J 14(5):1090-100.

3. Miller TA (2000). Diagnostic evaluation of erectile dysfunction. American family physician 61(1):95–104.

4. Disanto ME (2005). Contractile mechanisms in diabetes-related erectile dysfunction. Curr Pharm Des 11(31):3995-4010.

5. Tamler R, Deveney T (2010). Hypogonadism, erectile dysfunction, and type 2 diabetes mellitus: what the clinician needs to know. Postgrad Med 122(6):165-75.

6. Avasthi A et al (2011), Grover S, Bhansali A, Dash RJ, Gupta N, Sharan P, et al. Erectile dysfunction in diabetes mellitus contributes to poor quality of life. Int Rev Psychiatry 23(1):9 3 -9.

7. El-Sakka AI, Tayeb KA (2003). Erectile dysfunction risk factors in noninsulin dependent diabetic Saudi patients. J Urol 69(3):1043-7.

8. Giuliano FA, Leriche A, Jaudinot EO (2004). Prevalence of erectile dysfunction among 7689 patients with diabetes or hypertension, or both. Urology 64(6):1196-201.

9. Abdulmohsen MF, Abdulrahman IS, Al-Khadra AH et al (2004). Physicians' knowledge, attitude and practice towards erectile dysfunction in Saudi Arabia. East Mediterr Health J 10(4-5):648-54.

10. Zedan H et al (2010).Cigarette smoking, hypertension and diabetes mellitus as risk factors for erectile dysfunction in upper Egypt. East Mediterr Health J 16(3):281-5.

11. Seftel AD, Sun P, Swindle R (2004). The prevalence of hypertension, hyperlipidemia, diabetes mellitus and depression in men with erectile dysfunction. J Urol 171(6 Pt 1):2341-5.

12. Cho NH et al (2006). Prevalence of erectile dysfunction in Korean men with Type 2 diabetes mellitus. Diabet Med 23(2):198-203.

13. Siu SC et al (2001). Prevalence of and risk factors for erectile dysfunction in Hong Kong diabetic patients. Diabet Med 18(9):732-8.

14. Palumbo et al (2007). Metabolic16- risk factors, endothelial dysfunction, and erectile dysfunction in men with diabetes. Am J Med Sci 334(6):466-80.

15. Buranakitjaroen P, Phoojaroenchanachai M, Saravich S (2006). Prevalence of erectile dysfunction among treated hypertensive males. J Med Assoc Thai 89:S28-36.

16. Yamasaki H, Ogawa K, Sasaki H, Nakao T (2004). Prevalence and risk factors of erectile dysfunction in Japanese men with type 2 diabetes. Diabetes Res Clin Pract 66 Suppl 1: S173-177.

17. Khatib FA, Jarrah NS, Shegem NS (2006), Bateiha AM, Abu-Ali RM, Ajlouni KM. Sexual dysfunction among Jordanian men with diabetes. Saudi Med J 27(3):351-6.

18. Jan M, Zafar J, Siddiqui SA (2005). Frequency of erectile dysfunction in patients with diabetes mellitus. Ann Pak Inst Med Sci 1: 27-31.

19. Kalter-Leibovici O, Wainstein J (2005). Harman-Bohem I, Murad H, Raz I. Clinical, socioeconomic, and lifestyle parameters associated with erectile dysfunction among diabetic men. Diabetes Care 28: 1739-44.

20. Meuleman EJ (2002). Prevalence of erectile dysfunction: need for treatment? Int J Impot Res 14 Suppl 1: S22-28.

21. Rami Ibrahim Faraj (2013). Erectile dysfunction among diabetic patients registered in Al-Iskan Primary Health Care, Makkah, 2011. American Journal of Research Communication 1(10): 16-39.

22. Mofid A, Seyedalinaghi SA, Zandieh S , Yazdani T (2009). Prevalence and Risk Factors of Erectile Dysfunction in Iranian Diabetic Men. Acta Medica Iranica 47(4): 309-314.

23. Cappelleri JC, Rosen RC (2005). The Sexual Health Inventory for Men (SHIM): a 5-year review of research and clinical experience. Int J Impot Res 17: 307-319.

24. William A (1998). The management of erectile dysfunction associated with diabetes. Sex Dys 1: 113-8.

25. Braun M, Wassmer G, Klotz T, Reifenrath B, Mathers M, Engelmann U(2000). Epidemiology of erectile dysfunction; results of the Cologne Male Survey. Int J Impot Res 12: 305-311.

26. Ponholzer A, Temml C, Mock K, Marszalek M, Obermayr R, Madersbacher S (2005). Prevalence and risk factors for erectile dysfunction in 2869 men using a validated questionnaire. Eur Urol 47: 80-86.

27. Miyata Y, Shindo K, Matsuya F, Noguchi M, Nishikido M, Koga S (2004). Erectile dysfunction in hemodialysis patients with diabetes mellitus: association with age and hemoglobin A1c levels. Int J Urol 11: 530-534.

ONLINE SUBMISSION OF MANUSCRIPT

It is mandatory to submit the manuscripts at the following website of KJMS. It is quick, convenient, cheap, requirement of HEC and Paperless.

Website: **www.kjms.com.pk**

The intending writers are expected to first register themselves on the website and follow the instructions on the website. Author agreement can be easily downloaded from our website. A duly signed author agreement must accompany initial submission of the manuscript.