DOI: 10.7860/JCDR/2016/16273.7488

Original Article

Dermatology Section

Impact of Uraemic Pruritus on Quality of Life among End Stage Renal Disease Patients on Dialysis

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ABSTRACT

Introduction: Uraemic pruritus is significant complication in (ESRD) patients and substantially impairs their quality of life (QOL). ESRD is a bothersome problem with attempts being made to increase the survival of patients on dialysis.

Aim: An attempt was made to compare the QOL of haemodialysis patients and suffering from uraemic pruritus with the QOL of those on haemodialysis but with no presenting uraemic pruritus.

Materials and Methods: A cross-sectional study was conducted to evaluate the QOL of haemodialysis patients suffering from uraemic pruritus. The WHOQOL-BREF questionnaire was used to assess the QOL. Haemodialysis patients with pruritus who had completed three months of maintenance haemodialysis (n=100) were enrolled into the study and 100 controls (n=100) on haemodialysis but with no pruritus were further enrolled.

Results: The QOL of haemodialysis patients with pruritus was found to be significantly impaired ($p < 0.05$) in comparison to those on haemodialysis with no prutitis, particularly with respect to all the four WHOQOL-BREF domains.

Conclusion: Quality of life of ESRD patients on dialsysis was siginificantly affected by pruritis.

Keywords: Creatinine, Itching, Renal failure

INTRODUCTION

End Stage Renal Disease (ESRD) is a bothersome problem with attempts being made to increase the survival of patients on dialysis. A large number of studies have implied a decrease in the health-related quality of life (HRQoL), of patients on haemodialysis with much emphasis on its need to improve [1–7]. Uraemic pruritus (UP), i.e. a chronic condition caused by renal failure has a prevalence ranging from 20% to 70% [8–13]. Not yet fully understood, UP usually starts 3 to 6 months after the onset of renal dialysis [8–11]. However, in some subjects UP may be present even before haemodialysis [12]. To analyse and extend these data, we aimed to investigate the impact of UP and its intensity on the life quality of patients with ESRD undergoing HD in Egypt in a cross-sectional study using validated questionnaires.

MATERIALS AND METHODS

Study Population

A case-control study was conducted during the period from April 2012 to December 2012. This study was carried out on 100 patients with ESRD, on regular haemodialysis and complaining of UP. The severity of pruritus was calculated using Numerical Rating Scale (NRS). In addition, the study also included a control group, which consists of another one hundred patients with end stage renal disease (ESRD) and on regular haemodialysis but not complaining of UP.

Two hundred patients with ESRD from renal dialysis units in Al-Azhar University Hospitals were selected. Patients were included in the study if they were more than 18-year old and undergoing regular heamodialysis. All patients underwent a detailed physical examination. The demographic and clinical data, including: age, gender, underlying renal disease, type and duration of HD and presence of pruritus were collected by a single investigator (dermatologist). The exclusion criteria included other possible causes of pruritus, such as: skin diseases or haematological diseases. The study was approved by the local ethics committee

Assessment of Quality of Life

The WHOQOL-BREF is a 26-item instrument consisting of four domains: physical health (7 items), psychological health (6 items), social relationships (3 items) and environmental health (8 items); it also contains QOL and general health items. Each individual item of the WHOQOL-BREF is scored from 1 to 5 on a response scale, which is stipulated as a five point ordinal scale. The scores are then transformed linearly to a 0–100-scale [14,15]. The physical health domain includes items on mobility, daily activities, functional capacity, energy, pain and sleep. The psychological domain measures include self-image, negative thoughts, positive attitudes, self-esteem, mentality, learning ability, memory concentration, religion and the mental status. The social relationships domain contains questions on personal relationships, social support, and sex life. The environmental health domain covers issues related to financial resources, safety, health and social services, living physical environment, opportunities to acquire new skills and knowledge, recreation, general environment (noise, air pollution, etc.,) and transportation.

Laboratory Investigations

In all heamodialysis patients, blood samples were obtained to be tested for urea and creatinine serum level.

STATISTICAL ANALYSIS

By using Epi info program by microsoft windows on personal computer. The collected data were coded, entered, analysed and tabulated. Mean±SD and chi-square were the statistical methods used during the present study. The p-value of 0.05 was the accepted level of significance during the study. The sample size was estimated based on the following items: average prevalence rate of end stage renal failure on dialysis in Egypt is 265 per million (0.0265%) (Ahmed et al., 2010) and prevalence rate of uraemic pruritus in end stage renal failure in Egypt is 32% (Attia et al., 2010). Margin of sampling error tolerated is 5%. By using the following sample size equation formula (Vaughan and Morrow, 1989):

$$n = \frac{PQ}{(1/1.96)^2}$$

n = minimal sample size required for the thesis
P = prevalence rate
Q = 100-P
e = margin of sampling error tolerated.

RESULTS

The physical domain for those with UP on haemodialysis was significantly impaired in comparison to the control subjects on haemodialysis with no UP ($p<0.05$) with the exception to the daily energy and work capacity satisfaction modules. Socially, impairment was significant with regards to the patient personal relationships and friend support ($p<0.05$) while sex life satisfaction showed no significant impairment. Psychologically, there was a much significant impairment regarding all modules of the questionnaire ($p<0.05$). Environmentally, all modules of the questionnaires showed impairment of statistical significance ($p<0.05$) with the exception to the money needs and living place satisfaction.

Mean creatinine level was 8.98±2.8 mg/dl and 9.65±3.22 mg/dl in cases and control groups respectively, while the mean urea level of the studied groups was 115.9±39.9 mg/dl and 118.4±39.15 mg/dl in cases and control groups respectively. There was no statistical significance difference between the two groups [Table/Fig-1-7].

Serum creatinine and blood urea	Cases = 100 mg/dl	Control= 100 mg/dl	t-test	p-value
Creatinine Normal values range (0.8 -1.4 mg/dL)				
Mean±Std Range	8.98±2.8 2.4-16	9.65±3.22 3-18	1.4	0.2
Urea Normal values range (7 - 20 mg/dL)				
Mean±Std Range	115.9±39.93 41-198	118.38±39.15 14-211	0.4	0.7

[Table/Fig-1]: Serum creatinine and blood urea level among the studied groups.

General characteristics	Cases N. = 100 (No. %)	Control N. = 100 (No. %)	Test of significance	p-value *: significant
Age Range Mean±Std	 21-74 49.5 ± 11.5	 18-77 48.9 ± 12.3	 t-test = 0.39	 0.7
Marital status Single Married Divorced Widow Chi-square=3.39 p-value=0.34	 10 (10) 72 (72) 8 (8) 10 (10)	 6 (6) 75 (75) 4 (4) 15 (15)	Chi-square 1.09 0.23 1.04 1.14	 0.2971 0.6308 0.2336 0.2850
Occupation White collar Blue collar Retired House wife Unemployed Chi-square=5.18 p-value = 0.27	 7 (7) 5 (5) 22 (22) 55 (55) 11 (11)	 5 (5) 7 (7) 34 (34) 48 (48) 6 (6)	Chi-square 0.35 0.35 3.57 0.89 1.61	 0.5515 0.5515 0.05878 0.3219 0.20488
Disability Yes No Chi-square=1.22 p-value= 0.27	 14 86	 8 92	Chi-square 1.84 1.84	 0.1751 0.1751
Gender Male Female Chi-square= 3.44 p-value= 0.064	 37 63	 50 50	Chi-square 3.4 3.4	 0.06 0.06

[Table/Fig-2]: General characteristics of the study population.

Physical aspects	Cases (N. = 100) (No. %)	Control (N. = 100) (No. %)	Chi-square	p-value *: significant
Physical pain prevent doing need - Not at all - A little - A moderate amount - Very much - An extreme amount Chi-square = 21.5 p-value = 0.0001*	 0 (0) 0 (0) 17 (17) 76 (76) 7 (7)	 0 (0) 5 (5) 39 (39) 55 (55) 1 (1)	 5.13 20.90 9.76 4.69	 0.0235* 0.00000048* 0.00178* 0.30383
Treatment needs to function - Not at all - A little - A moderate amount - Very much - An extreme amount Chi-square = 6.1856 p-value = 0.0454*	 0 (0) 0 (0) 0 (0) 100 (100) 0 (0)	 0 (0) 1 (1) 5 (5) 94 (94) 0 (0)	 1.01 5.13 6.19	 0.3160 0.02354* 0.01287*
Daily energy - Not at all - A little - A moderate amount - Mostly - Completely Chi-square= 3.9087 p-value = 0.2715	 7 (7) 61 (61) 31 (31) 1 (1) 0 (0)	 3 (3) 57 (57) 36 (36) 4 (4) 0 (0)	 1.68 0.33 0.56 1.85	 0.19436 0.5652 0.4538 0.1742
Get around ability - Very poor -Poor - Neither poor nor good - Good - Very good Chi-square= 26.4611 p-value = 0.000*	 5 (5) 42 (42) 39 (39) 14 (14) 0 (0)	 1 (1) 23 (23) 30 (30) 46 (46) 0 (0)	 2.75 8.23 1.97 24.38	 0.097306 0.041251* 0.18065 0.0000008*
Sleep satisfaction - Very dissatisfied - Dissatisfied - Neither satisfied nor dissatisfied - Satisfied - Very satisfied Chi-square= 88.5406 p-value = 0.000*	 6 (6) 57 (57) 17 (17) 20 (20) 0 (0)	 0 (0) 7 (7) 8 (8) 85 (85) 0 (0)	 57.44 3.7 84.71	 0.00001* 0.05431 0.00001*
Activity performance ability - Very dissatisfied - Dissatisfied - Neither satisfied nor dissatisfied - Satisfied - Very satisfied Chi-square = 15.0933 p-value = 0.0017*	 2 (2) 62 (62) 32 (32) 4 (4) 0 (0)	 0 (0) 38 (0) 59 (59) 10 (10) 0 (0)	 11.52 14.7 2.76	 0.000688* 0.000126* 0.09634
Work capacity satisfaction - Very dissatisfied - Dissatisfied - Neither satisfied nor dissatisfied - satisfied - Very satisfied Chi-square= 6.5497 p-value =0.0877	 7 (7) 86 (86) 7 (7) 0 (0) 0 (0)	 3 (3) 81 (81) 13 (13) 3 (3) 0 (0)	 1.68 0.91 2.0 3.05	 0.1943 0.34083 0.1572 0.08095

[Table/Fig-4]: Physical aspects of quality of life domain among the studied groups.

DISCUSSION

UP is a significant complication in ESRD patients and substantially impairs their QOL. Minimizing the severity of pruritus remains to be

Degree of affection of QOL domain	Physical domain		Social domain		Psychological domain		Environmental domain	
	Cases N.=100 (No. %)	Control N.=100 (No. %)	Cases N.=100 (No. %)	Control N.=100 (No. %)	Cases N.=100 (No. %)	Control N.=100 (No. %)	Cases N.=100 (No. %)	Control N.=100 (No. %)
Mild (0:25%)	0 (0)	0 (0)	12 (12) Chi=3.45 p-value= 0.06	22 (22)	0 (0)	9 (9)	0 (0)	0 (0)
Mild-moderate (26:50%)	2 (2) Chi=21.4 p-value=0.000004	24 (24)	66 (66) Chi=1.95 p-value=0.16	75 (75)	42 (42) Chi=33.96 p-value=0.001	82 (82)	39 (39) Chi=9.7 p-value=0.0019	61 (61)
Moderate (51:75%)	84 (84) Chi=3.01 p-value=0.083	74 (74)	22 (22) Chi=16.5 p-value= 0.00005	3 (3)	57 (57) Chi=53.3 p-value=0.001	9 (9)	60 (60) Chi=8.8 p-value=0.0029	39 (39)
Severe (76:100%)	14 (14) Chi=9.8 p-value=0.0018	2 (2)	0 (0)	0 (0)	1 (1)	0 (0)	1 (1)	0 (0)

[Table/Fig-3]: Degree of affection of different domains of quality of life among studied group.

Social aspects	Cases N. = 100 (No. %)	Control N. = 100 (No. %)	Chi-square	p-value *: significant
Personal relationship satisfaction				
- Very dissatisfied	1 (1)	1 (1)		
- Dissatisfied	11 (11)	0 (0)		
- Neither satisfied nor dissatisfied	19 (19)	15 (15)	0.57	0.4514
- Satisfied	46 (46)	84 (84)	31.74	0.00001*
- Very satisfied	5 (5)	0 (0)		
Chi-square= 19.1733				
p-value = 0.0007*				
Sex life satisfaction				
- Very dissatisfied	0 (0)	0 (0)		
- Dissatisfied	32 (32)	37 (37)	0.55	0.4570
- Neither satisfied nor dissatisfied	41 (41)	39 (39)	0.08	0.7728
- Satisfied	27 (27)	24 (24)	0.76	0.3817
- Very satisfied	0 (0)	0 (0)		
Chi-square= 0 .5888				
p-value= 0.7450				
Friend supporting				
- Very dissatisfied	0 (0)	0		
- Dissatisfied	4 (4)	3 (3)	0.96	0.4070
- Neither satisfied nor dissatisfied	15 (15)	2 (2)	10.86	0.0009802*
- Satisfied	81 (81)	95 (95)	9.28	0.02316*
- Very satisfied	0 (0)	0 (0)		
Chi-square=12.7215				
p-value = 0.0053*				

[Table/Fig-5]: Social aspects of quality of life domain among the studied groups.

Psychological aspects	Cases N.= 100 (No. %)	Control N. = 100 (No. %)	Chi-square	p-value *: significant
Life enjoyment				
- Not at all	1 (1)	0 (0)		
- A little	53 (53)	15 (15)	3.21	0.001*
- A moderate a mount	42 (42)	58 (58)	5.12	0.023*
- Very much	4 (4)	27 (27)	20.19	0.000007*
- An extreme amount	0 (0)	0 (0)		
Chi-square=41.8598				
p-value=0.0000*				
Your life meaningful				
- Not at all	0 (0)	0 (0)		
- A little	11 (11)	5 (5)	2.45	0.118
- A moderate amount	36 (36)	18 (18)	8.22	0.0041*
- Very much	53 (53)	77 (77)	12.66	0.00037*
- An extreme amount	0 (0)	0 (0)		
Chi-square= 12.6808				
p-value= 0.0018*				
Concentration ability				
- Not at all	0 (0)	0 (0)		
- A little	32 (32)	1 (1)	3.49	0.000*
- A moderate amount	40 (40)	23 (23)	6.70	0.009*
- Very much	28 (28)	76 (76)	46.15	0.001*
- An extreme amount	0 (0)	0 (0)		
Chi-square= 55.8624				
p-value= 0.0000*				
Body appearance acceptance				
- Not at all	1 (1)	0 (0)		
- A little	28 (28)	8 (8)	13.55	0.0002*
- A moderate amount	44 (44)	47 (47)	0.18	0.67
- Mostly	27 (27)	45 (45)	7.03	0.008*
- Completely	0 (0)	0 (0)		
Chi-square= 16.7100				
p-value= 0.0008*				
Yourself satisfaction				
- Very dissatisfied	1 (1)	0 (0)		
- Dissatisfied	19 (19)	4 (4)	11.05	0.0008*
- Neither satisfied nor dissatisfied	37 (37)	17 (17)	10.15	0.0014*
- Satisfied	43 (43)	79 (79)	27.24	0.0001*
-Very satisfied	0 (0)	0 (0)		
Chi-square= 28.8130				
p-value= 0.0000*				
Have negative feeling				
- Never	0 (0)	0 (0)		
- Seldom	11 (11)	30 (30)	11.08	0.0009*
- Quite often	20 (20)	46 (46)	15.92	0.00009*
- Very often	68 (68)	23 (23)	40.83	0.00001*
- Always	1 (1)	1 (1)		
Chi-square= 41.3000				
p-value= 0.0000*				

[Table/Fig-6]: Psychological aspects of quality of life domain among the studied groups.

Environmental aspect	Cases N. = 100 (No. %)	Control N. = 100 (No. %)	Chi-square	p-value *: significant
Safty feeling				
- Not at all	1 (1)	0 (0)		
-A little	49 (49)	34 (34)	4.63	0.03*
-A moderate a mount	20 (20)	39 (39)	8.68	0.003*
- Very much	30 (30)	27 (27)	0.22	0.64
- An extreme amount	0 (0)	0 (0)		
Chi-square=9.9874				
p-value = 0.00187*				
Healthy physical environment				
- Not at all	1 (1)	0 (0)		
-A little	27 (27)	40 (40)	3.8	0.05*
-A moderate a mount	33 (33)	14 (14)	10.04	0.0015*
- Very much	39 (39)	46 (46)	1.0	0.32
- An extreme amount	0 (0)	0 (0)		
Chi-square= 11.7797				
p-value = 0.0082*				
Enough money to needs				
- Not at all	4 (4)	1 (1)	1.85	0.17
-A little	64 (64)	53 (53)	2.5	0.11
-A moderate a mount	25 (25)	37 (37)	3.37	0.07
- Very much	7 (7)	9 (9)	0.27	0.6
- An extreme amount	0 (0)	0 (0)		
Chi-square = 5.4068				
p-value = 0.1443				
Day life available information				
- Not at all	0 (0)	0 (0)		
-A little	14 (14)	3 (3)	7.78	0.005*
-A moderate a mount	36 (36)	29 (29)	1.12	0.29
- Very much	50 (50)	68 (68)	6.7	0.0097*
- An extreme amount	0 (0)	0 (0)		
Chi-square = 10.6173				
p-value = 0.0049*				
Leisure activity opportunity				
- Not at all	8 (8)	3 (3)	2.4	0.12
-A little	74 (74)	57 (57)	6.4	0.011*
-A moderate a mount	18 (18)	38 (38)	9.92	0.0016*
- Very much	0 (0)	2 (2)	2.02	0.16
- An extreme amount	0 (0)	0 (0)		
Chi-square = 13.6217				
p-value = 0.0035*				
Living place satisfaction				
- Very dissatisfied	0 (0)	1 (1)		
- Dissatisfied	19 (19)	16 (16)	2.7	0.098
- Neither satisfied nor dissatisfied	29 (29)	30 (30)	0.02	0.88
-Satisfied	52 (52)	53 (53)	0.02	0.89
- Very satisfied	0 (0)	0 (0)		
Chi-square = 1.2836				
p-value = 0.7330				
Health service access satisfaction				
- Very dissatisfied	0 (0)	0 (0)		
- Dissatisfied	5 (5)	2 (2)	1.33	0.25
- Neither satisfied nor dissatisfied	29 (29)	9 (9)	13.0	0.0003*
-Satisfied	66 (66)	89 (89)	15.17	0.00009*
- Very satisfied	0 (0)	0 (0)		
Chi-square =15.2249				
p-value = 0.0005*				
Transport satisfaction				
- Very dissatisfied	3 (3)	0 (0)	3.05	0.08
- Dissatisfied 2	57 (57)	43 (43)	3.9	0.048*
- Neither satisfied nor dissatisfied	26 (26)	38 (38)	0.3	0.07
-Satisfied	14 (14)	19 (19)	0.9	0.34
- Very satisfied	0 (0)	0 (0)		
Chi-square = 7.9676				
p-value = 0.0467*				

[Table/Fig-7]: Environmental aspects of quality of life domain among the studied groups.

the main goal of therapy for those awaiting transplannation or who are not good candidates for the surgery [16,17].

UP is a significant complication in ESRD patients and substantially impairs their QOL. UP affects between 20 and 50% of renal failure patients. In addition, approximately 80% of patients undergoing haemodialysis were found to be affected by UP (Aramwit et al., 2012) [17].

This study was carried out on 100 patients with ESRD on regular haemodialysis and complaining of uraemic pruritus. The severity of pruritus was calculated using the numerical rating scale. In addition, the study also included a control group which consists of another

one hundred patients with end stage renal disease and on regular haemodialysis but not complaining of UP.

QOL was assessed by using the WHOQOL-BREF questionnaire. It covers all domains of quality of life (physical, social, psychological and environmental).

The present study shows that the mean age of the studied patients was 49.5±11.5 years and 48.9±12.3 years in cases and control groups respectively. This finding is similar to the study conducted by Sultan et al., to assess cutaneous manifestations in egyptian patients with chronic renal failure on regular haemodialysis that found that the mean age was 49.53±18.54 years [18]. Also, in a cross-sectional descriptive study which was conducted by Bele et al., the mean age of the patients was 42.13±13.48 years [19]. Szepietowski et al., it was found that the mean age of ESRD patients with uraemic pruritus was 64.21±0.72 years [20]. Moreover the mean age of ESRD patients was 58.12±16.11 years in a study conducted by Theofilo., [21]. The higher mean age of ESRD patients in western countries can be explained by better health care services and high socioeconomic level.

As regards the marital status, findings demonstrated that 75% of control group patients were married, while the rest were single (6%), divorced (4%) and 15% widow. These findings are quite similar to those reported by Franke et al., who explored different aspects of QoL throughout the course of ESRD [22]. They found that two third of the study sample were married but 7.5% were single and 21.3% were divorced. Also, in a cross-sectional study that was conducted by Bele et al., among the participants, 83.3% were married. Most of single and divorced patients referred their marital status to their illness [19].

Findings of the present study revealed that only 12% of both groups were working while the majority of patients didn't. Most of patients weren't capable of tolerating work load besides their illness and not because they were aged. This meets the finding of the study conducted by Chen et al., who studied signs of clinical depression of chronic haemodialysis patients in Taiwan [23]. They found that three fourth of the study sample didn't work. Creatinine and urea serum level it was found that there was no statistically significance difference between the cases and control groups.

In the present study as regards physical domain, it was found that there was a statistical significance difference between the cases and control group. This finding exists in correlation with a study conducted by Szepietowski et al., using the SF-12 questionnaire and DLQI questionnaire where they found that ESRD patients undergoing renal dialysis have a significant alteration in their QOL [20]. Impaired patient's physical QOL can be attributed to poor sleep quality leading to lose their ability to perform daily living activities and to get around.

The importance of the relationship between pruritus and sleep quality is that there is a higher mortality risk seen in patients with moderate-to-extreme pruritus explained by poor sleep quality (Wikström) [24].

As regards social domain, patient personal relationship satisfaction and friend supporting satisfaction there was statistical significance difference between cases and control group, while there was no statistical significant correlation between severity of pruritus and social QOL domian.

This meets the findings of a study conducted by Mathur et al., to assess the effect of UP in haemodialysis patients HR-QOL measures in domains such as mood and social relations, they found that there is a significant effect of UP on sleep, mood, and social functioning, while they found statistical significant correlation between severity of pruritus and social QOL domain [25].

As regards the social QOL of cases and control groups, it was mildly to moderately impaired. These finding may be accepted among Egyptian urban populations who commonly identify themselves as spiritual. Patel et al., found that perceived social support was correlated with increased level of religiosity and spirituality [26]. This meets the finding of the study conducted by Spinale et al., who found a relationship between religion and increased perception of social support in people who identify themselves as spiritual or religious are often who involved in religious communities and typically report higher social support scores compared with individuals who are not identified as religious [27].

Inability to work coupled with low socioeconomic status and high cost of treatment may impact patient's psychological state, perceiving a high burden of disease and hampering the quality of social interaction (Bele et al.,) [19].

Only 25% of patients and controls were satisfied with their sex life performance. So far, there was no published data comparing the correlation between sexual dysfunction and uraemic pruritus, but another multicenter study conducted by Lew-Starowicz and Gellert, to correlate the sexuality and quality of life of haemodialyzed patients found that sexual disability correlates with depression and anxiety and seriously impacts the QOL in dialyzed patients [28].

Regarding the psychological domain, there was a marked statistical significance difference between cases and control group in all aspects and a much impaired lifestyle. These results were similar to a study conducted by Weisbord et al., to assess symptoms including UP in patients who are on maintenance haemodialysis and their relationship to quality of life and depression [29]. Dialysis Symptom Index which was developed they used to assess the presence and the severity of symptoms. The environmental domain identified statistical significance between the cases and control groups. Except in questions of environmental domain about enough money to needs and living place satisfaction there was no statistical significance difference between the cases and control group. In the different compartments of environmental QOL affection, there was statistical significance difference between the cases and controls. These findings correlate to a study conducted by Szepietowski et al., using DLQI questionnaire [20].

CONCLUSION

In conclusion, this study sheds more light on the various clinical features of one of the most bothersome symptoms for patients with end stage renal disease. The quality of life of haemodialysis patients with pruritus was found to be significantly impaired in comparison to those on haemodialysis with no prutitis, particularly with respect to all the four WHOQOL-BREF domains. A better understanding of this symptom and its features will afford both clinicians and researchers elementary tools toward the discovery of its origin and possible effective treatments. Moreover, the use of a standardized questionnaire will allow comparison of different treatments.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Aug 18, 2015**
Date of Peer Review: **Oct 15, 2015**
Date of Acceptance: **Nov 25, 2015**
Date of Publishing: **Mar 01, 2016**