Depression and Quality of Life in Patients with Neurological Disorder in a Malaysian Hospital

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Abstract

Objective: To investigate association between major depressive disorder (MDD) and quality of life in patients with neurological disorder.

Methods: This cross-sectional study was carried out at a Malaysian hospital between April 2016 and December 2016 using convenience sampling. Patients aged ≥ 18 years with intracranial tumour or other brain disorders were invited to participate. Quality of life was assessed using the European Organisation for Research and Treatment of Cancer Quality of Life questionnaire version 3.0; diagnosis of MDD was made using Mini International Neuropsychiatric Interview.

Results: Of 122 patients approached, 100 (66 women and 34 men) were included (response rate, 93.5%), with a mean age of 45.3 years. The prevalence of MDD in patients with neurological disorder was 30%. Compared with non-depressed patients, patients with MDD had poorer global health status / quality of life ($p = 0.003$), and reduced physical ($p = 0.003$), role ($p = 0.021$), emotional ($p < 0.001$), cognitive ($p = 0.004$), and social ($p = 0.007$) functioning, as well as more symptoms of fatigue ($p = 0.004$), pain ($p < 0.001$), dyspnoea ($p = 0.033$), insomnia ($p < 0.001$), appetite loss ($p = 0.002$), constipation ($p = 0.034$), diarrhoea ($p = 0.021$), and financial difficulties ($p = 0.039$).

Conclusion: Patients with MDD had reduced quality of life. Fatigue, pain, dyspnoea, insomnia, appetite loss, constipation, diarrhoea, and financial difficulties were prevalent among patients with MDD.

Key words: Brain diseases; Brain neoplasms; Depressive disorder, major; Quality of life

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Introduction

Astrocytic glioma, medulloblastoma, and meningothelial tumours are common nervous system tumours.¹ Neoplastic progression or its treatment may cause major depressive

disorder (MDD) symptoms, including anorexia, fatigue, reduced concentration, and insomnia secondary to pain.² In a mouse model, chronic behavioural stress results in greater tumour burden and more invasive growth of ovarian carcinoma cells.³ Glial cells support the network of brain systems. Compared with people without depression, people with depression have noticeable changes in glial cells, including reduced frontal cortical glial cell density and neuronal size.⁴⁻⁶

The diagnosis of brain tumour has a severe negative influence on patient quality of life, including emotional, cognitive, and physical functioning.⁷ Untreated depression affects the hospital stay, therapy compliance, ability to self-care, quality of life, and survival rate of patients with brain tumour.⁷ Studies of psychiatric disorders and quality of life in patients with cancer in Western countries have been reported.⁸⁻¹⁰ However, to the best of our knowledge, there are no such studies in Malaysia. The quality of life may be a fundamental mechanism that explains depression in patients with intracranial tumour or other brain disorder. Therefore, the present study aimed to investigate association between MDD and quality of life in patients with neurological disease.

Methods

The present study was approved by the Medical Research & Ethics Committee of the Ministry of Health of Malaysia

(NMRR-16-1134-29874 (IIR) and Human Research Ethics Committee of Universiti Sains Malaysia (USM/ JEPeM/16050178).

This cross-sectional study was conducted in the neurological unit at Hospital Kuala Lumpur Malaysia between April 2016 and December 2016 using convenience sampling. The hospital is a tertiary referral centre for neurological diseases (including intracranial tumour and other brain disorders).

Sample size was calculated using a single proportion formula:¹¹

$$n = Z^2 P (1-P) / d^2,$$

where Z is the level of confidence (1.96 standard errors from the mean, with a level of significance of $\alpha = 0.05$), P is the expected prevalence of MDD among all brain disorders (assumed to be 6.5%¹²), and d is the precision of P (set at 5%). Considering a dropout rate of 15%, a sample size of 107 brain disorder patients were required.

Patients aged ≥ 18 years with neurological disorder who were able to read Malay, English, Mandarin, or Tamil and were conscious and responsive were invited to participate. Medical records were retrieved, and socio-demographic and medical data collected. Quality of life was assessed using the European Organisation for Research and Treatment of Cancer Quality of Life questionnaire version 3.0 (EORTC QLQ-C30); the diagnosis of MDD was made using the Mini International Neuropsychiatric Interview.¹³⁻¹⁵ For EORTC QLQ-C30, scores for all scales range from 1 (not at all) to 4 (very much), except for the global health status scale that ranges from 1 (very poor) to 7 (excellent). The raw score for each scale was linearly transformed to scores 0-100. Higher scores in the functioning scale indicate better global health status, whereas higher scores in the symptom scale indicate more symptoms.¹⁶

Data were analysed using SPSS (Windows version 22.0; IBM Corp, Armonk [NY], US). The Mann-Whitney U test was used for comparison of non-parametric data between patients with MDD and non-depressed patients. A p value of <0.05 was considered statistically significant.

Results

Of 122 patients approached, 22 were excluded owing to age <18 years ($n = 10$), other diagnosis ($n = 3$), and withdrawal or incomplete study ($n = 9$) and 100 (66 women and 34 men) were included (response rate, 93.5%), with a mean age of 45.3 years. Of the 100 patients, most were in the age-group of 41-50 years (25%), followed by 31-40 years (21%) and 51-60 years (21%) [Table 1].

The prevalence of MDD in patients with neurological disorder was 30%. Compared with non-depressed patients, patients with MDD had poorer global health status / quality of life ($p = 0.003$), and reduced physical ($p = 0.003$), role ($p = 0.021$), emotional ($p < 0.001$), cognitive ($p = 0.004$), and social ($p = 0.007$) functioning, as well as more symptoms of fatigue ($p = 0.004$), pain ($p < 0.001$), dyspnoea ($p = 0.033$), insomnia ($p < 0.001$), appetite loss ($p = 0.002$), constipation

($p = 0.034$), diarrhoea ($p = 0.021$), and financial difficulties ($p = 0.039$) [Table 2].

Discussion

In the present study, the prevalence of MDD among patients with neurological disorder was 30%, which is comparable with the 28% of patients with brain tumour who have MDD.¹⁷ Depression was prevalent among patients with brain tumour around the time of diagnosis or treatment.¹⁸ The prevalence of depression among primary brain tumour patients has been reported to be 2.5% to 15.4%,¹² and as much as 44% among all brain tumour patients.¹⁹ A study in Taiwan found that the prevalence of depression among patients with cancer was 20%.²⁰ Asian populations typically have lower prevalence of MDD than do Western populations.²¹ A systematic review of 100 studies found that the prevalence of depression among patients with cancer ranged from 0% to 58%, independent of site and stage of the cancer.²²

In the present study, patients with MDD had significantly reduced physical, role, emotional, cognitive, and social functioning than non-depressed patients. Symptoms of MDD such as worrying about the future, disappointed feelings, tiredness, reduced memory power, difficulties in sleeping, and decreased physical functioning have been reported to lead to tremendous losses from noxious stimuli and the environment.²³ Such patients have been reported to have serious emotional and physical limitations and poor mental health status.^{24,25} Predictors of MDD include frontal region of tumour location, combined symptoms of sadness and lack of motivation, and family psychiatric history.²⁶ The effect of depression on the immune system may influence resistance to tumour progression in patients with cancer.²⁷

The current study also reported more symptoms of fatigue, pain, dyspnoea, insomnia, appetite loss, constipation, diarrhoea, and financial difficulties in patients with MDD than in non-depressed patients. Patients with cancer typically have higher mean scores in the symptom scale and experience fatigue followed by pain and insomnia; common symptoms included fatigue (55%), reduced role functioning (49%), insomnia (46%), pain (37%), and dyspnoea (36%), with vomiting being considered distressing.²⁸ Constipation is reported as a predictor for depression among patients with incurable cancer.²⁹ Symptoms such as appetite loss and nausea and vomiting are prevalent among patients with cancer; appetite loss may be caused by active treatment regimens.²⁴

In the present study, quality of life was poor in patients with MDD. This result is similar to that of Pamuk et al²⁵ who reported a negative effect of depression on the global quality of life and physical, psychological, and social functioning among patients with depression and malignant cancer undergoing active treatment. Intracranial tumours and brain disorders are life-threatening and affect quality of life. Better understanding of the role of quality of life

Table 1. Socio-demographic and clinical characteristics of participants (n = 100)

Characteristics	No. (%) of participants
Age (years)	
18-20	2 (2.0)
21-30	15 (15.0)
31-40	21 (21.0)
41-50	25 (25.0)
51-60	21 (21.0)
61-70	15 (15.0)
71	1 (1.0)
Sex	
Women	66 (66.0)
Men	34 (34.0)
Ethnicity	
Malay	78 (78.0)
Chinese	12 (12.0)
Indian	9 (9.0)
Others	1 (1.0)
Religion	
Muslim	78 (78.0)
Buddhist	11 (11.0)
Hindu	7 (7.0)
Christian	3 (3.0)
Others	1 (1.0)
Marital status	
Single	24 (24.0)
Married	74 (74.0)
Widowed	1 (1.0)
Divorced	1 (1.0)
Children	
Yes	68 (68.0)
No	32 (32.0)
Highest level of formal education	
Primary	13 (13.0)
Secondary	48 (48.0)
College/university	38 (38.0)
No education	1 (1.0)
Highest certificate	
Primary School Evaluation Test (UPSR/PSET)	12 (12.0)
Lower Certificate of Education (PMR/SRP/LCE)	14 (14.0)
Malaysian Certificate of Education (SPM/SPMV/MCE)	29 (29.0)
Malaysian Higher School Certificate (STPM/HSC)	3 (3.0)
Certificate/diploma	20 (20.0)
Degree	18 (18.0)
Master	3 (3.0)
No education	1 (1.0)

Table 1. (cont'd)

Characteristics	No. (%) of participants
Occupation status	
Working	55 (55.0)
Not working	45 (45.0)
Working sector	
Government	21 (21.0)
Non-government	31 (31.0)
Self employment	1 (1.0)
Semi-government	2 (2.0)
Not working	45 (45.0)
Total monthly household income (RM)	
0-3000	53 (53.0)
3001-6000	13 (13.0)
6001-9000	8 (8.0)
>9001	4 (4.0)
Others	22 (22.0)
Year of diagnosis	
2015-2016	34 (34.0)
2013-2014	17 (17.0)
2011-2012	11 (11.0)
2009-2010	6 (6.0)
2007-2008	7 (7.0)
2005-2006	3 (3.0)
<2005	14 (14.0)
Others	8 (8.0)
Neurological disorder	
Astrocytic glioma	13 (13.0)
Meningioma	19 (19.0)
Pituitary adenoma	15 (15.0)
Carvenoma	7 (7.0)
Schwanoma	5 (5.0)
Craniopharyngioma	3 (3.0)
Ethmoid	1 (1.0)
Frontal lobe tumour	1 (1.0)
Fibrosarcoma	1 (1.0)
Cerebellar oedema	4 (4.0)
Germinoma	1 (1.0)
Haemorrhagic brain	3 (3.0)
Metastatic carcinoma	1 (1.0)
Brain lesion	2 (2.0)
Mucopyocele	1 (1.0)
Aneurysm	1 (1.0)
Hydrocephalus	3 (3.0)
Unclassified neurological disorder	19 (19.0)
Treatment	
Medication	18 (18.0)
Chemotherapy	4 (4.0)
Radiotherapy	3 (3.0)
Chemotherapy and radiotherapy	1 (1.0)
Medication and radiotherapy	2 (2.0)
Medication and waiting for surgery	1 (1.0)
Endoscopic operation radiotherapy	1 (1.0)
Surgery	30 (30.0)
Surgery and medication	5 (5.0)
Surgery, medication, and radiotherapy	1 (1.0)
Waiting for surgery	1 (1.0)
Waiting for chemotherapy	1 (1.0)
Waiting for laser treatment	1 (1.0)
Others	31 (31.0)

Table 2. European Organisation for Research and Treatment of Cancer Quality of Life questionnaire version 3.0 scores (EORTC QLQ-C30) in patients with neurological disorder with or without depression (n=100)

EORTC QLQ-C30	Score, median (interquartile range)		Z statistic (Mann-Whitney U test)	p Value
	With depression	Non-depressed		
Global health status	50.0 (33.3)	66.7 (33.3)	-2.964	0.003
Functioning				
Physical functioning	63.3 (41.7)	86.7 (26.7)	-2.951	0.003
Role functioning	66.7 (50.0)	83.3 (33.3)	-2.308	0.021
Emotional functioning	50.0 (41.7)	75.0 (27.1)	-4.272	<0.001
Cognitive functioning	50.0 (37.5)	66.7 (50.0)	-2.902	0.004
Social functioning	83.3 (50.0)	100.0 (16.7)	-2.721	0.007
Symptom				
Fatigue	66.7 (69.4)	33.3 (36.1)	-2.846	0.004
Nausea and vomiting	0.0 (37.5)	0.0 (16.7)	-0.642	0.521
Pain	50.0 (54.2)	16.7 (37.5)	-4.224	<0.001
Dyspnoea	0.0 (33.3)	0.0 (0.0)	-2.130	0.033
Insomnia	66.7 (100.0)	0.0 (33.3)	-3.734	<0.001
Appetite loss	0.0 (66.7)	0.0 (0.0)	-3.073	0.002
Constipation	0.0 (33.3)	0.0 (0.0)	-2.114	0.034
Diarrhoea	0.0 (8.3)	0.0 (0.0)	-2.304	0.021
Financial difficulties	33.3 (100.0)	0.0 (33.3)	-2.064	0.039

among patients with depression would help clinicians, health psychologists, psychiatrists, and counsellors to improve the overall treatment of patients.

There are limitations to the present study. Investigating depression and quality of life among neurological disorder patients is challenging because they have difficulties in responding actively during interviews owing to physical weakness and the severity of their illness. Thus, results should be interpreted with caution; the responses may have been influenced by the physical and emotional state of the participants at the time of the interviews.

Conclusion

Patients with MDD have reduced quality of life, especially in global health statuses, physical, role, emotional, cognitive, and social functioning, compared with non-depressed patients. Fatigue, pain, dyspnoea, insomnia, appetite loss, constipation, diarrhoea, and financial difficulties are prevalent among patients with MDD.

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