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# Prevalence of anxiety after stroke in physical rehabilitation patients in King Chulalongkorn Memorial Hospital

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**Objective** : *To examine the prevalence of anxiety and related factors in stroke patients who attend physical rehabilitation programs in King Chulalongkorn Memorial Hospital.*

**Design** : *Descriptive study*

**Method** : *This study was conducted at King Chulalongkorn Memorial Hospital from June to December 2003. A total number of 85 patients, whose age was above 15 years old and attend physical rehabilitation programs at that time were recruited. Hospital Anxiety and Depression Scale (HADS), Barthel ADL index and Beand and Weinert The Personal Resource Questionnaire : PRQ part II were performed and demographic data, medical and psychiatric history were recorded and analyzed.*

**Results** : *24.7 % of the stroke patients have at least some degree of anxiety. There are 3 factors significantly associated with anxiety. These factors are duration of illness more than 6 months, Barthel ADL index at the level of severely dependence and total dependence, and low social support . They are associated significantly with anxiety at statistical level $p < 0.01$ and from Stepwise Multiple Regression Analysis it showed that all the 3 factors are statistically associated with anxiety at level $p < 0.01$*

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**Conclusion** : *Duration of stroke longer than 6 months, severely and total dependence ADL index and poor social support systems are strongly associated with anxiety in stroke patients.*

**Keywords** : *Anxiety, Stroke, Physical rehabilitation.*

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**วัตถุประสงค์** : *เพื่อหาค่าความชุกของภาวะวิตกกังวล และปัจจัยที่เกี่ยวข้องกับภาวะดังกล่าวในผู้ป่วยอัมพาตครึ่งซีกจากโรคหลอดเลือดสมอง ที่เข้ารับการทำกายภาพบำบัด*

**รูปแบบการวิจัย** : *การศึกษาเชิงพรรณนา*

**วิธีการวิจัย** : *การศึกษานี้ทำในผู้ป่วยอัมพาตครึ่งซีกจากโรคหลอดเลือดสมอง ที่มาเข้ารับการทำกายภาพบำบัด ณ โรงพยาบาลจุฬาลงกรณ์ ในช่วงเดือนมิถุนายน ถึง ธันวาคม 2546 จำนวน 85 ราย โดยผู้ป่วยจะได้รับการสัมภาษณ์ข้อมูลส่วนตัว ประวัติทางจิตเวช และประวัติการเจ็บป่วยทางกาย นอกจากนี้ผู้ป่วยจะได้ตอบแบบสอบถามเพื่อคัดกรองภาวะวิตกกังวล (Hospital Anxiety And Depression Scale, HADS) และแบบสอบถามเกี่ยวกับแรงสนับสนุนทางสังคม (Beand and Weinert The Personal Resource Questionnaire : PRQ part II) ซึ่งเป็นแบบสอบถามที่ให้ผู้ป่วยเป็นผู้ประเมินคะแนนด้วยตนเอง (self administration questionnaires) รวมทั้งรวบรวมข้อมูลที่เกี่ยวข้องจากเวชระเบียน*

**ผลการศึกษา** : *พบความชุกของภาวะวิตกกังวลเท่ากับร้อยละ 24.7 โดยปัจจัยที่มีความสัมพันธ์กับภาวะวิตกกังวลอย่างมีนัยสำคัญทางสถิติ ได้แก่ ระยะเวลาที่เป็นอัมพาตครึ่งซีกมานานกว่า 6 เดือน ระดับความสามารถในการประกอบกิจวัตรประจำวันเป็นแบบช่วยเหลือตัวเองได้น้อยมาก หรือช่วยเหลือตัวเองไม่ได้เลย และมีแรงสนับสนุนทางสังคมน้อย โดยทั้ง 3 ตัวแปร มีความสัมพันธ์กับภาวะวิตกกังวลอย่างมีนัยสำคัญทางสถิติที่ระดับ $p < 0.01$ และเมื่อนำตัวแปรทั้ง 3 นี้มาทำการวิเคราะห์แบบถดถอยพหุคูณแบบขั้นตอน พบว่าทั้ง 3 ตัวแปรยังคงมีผลต่อภาวะวิตกกังวลอย่างมีนัยสำคัญทางสถิติที่ระดับ $p < 0.01$ ทุกตัวแปร*

**สรุปผลการศึกษา** : *ภาวะวิตกกังวลในผู้ป่วยกลุ่มนี้มีความสัมพันธ์กับระยะเวลาที่ป่วยเป็นอัมพาตครึ่งซีกมานานมากกว่า 6 เดือน ระดับความสามารถในการประกอบกิจวัตรประจำวันเป็นแบบช่วยเหลือตัวเองได้น้อยมาก หรือช่วยเหลือตัวเองไม่ได้เลย และมีแรงสนับสนุนทางสังคมน้อย*

**คำสำคัญ** : *ภาวะวิตกกังวล, อัมพาตครึ่งซีกจากโรคหลอดเลือดสมอง, กายภาพบำบัด*

Individuals who have stroke also endure a lot of sufferings[1-3], which are, for example, physical limitations, emotional trauma, job loss and familial rejection due to burden. In the treatment of stroke, there is an important concept of holistic approach, the so-called bio-psycho-social model. It is crucial to approach each individual with concern on their emotional problems, psychological reactions, familial burden due to physical illness and, promotion social support network.

Anxiety is one of the most common emotional problems found in stroke patients, that is characterized by sense of fear or apprehension, cognitive hypervigilance or problems in concentration, muscle tension and autonomic nervous system hyperactivity. Anxiety symptoms can appear in many anxiety disorders group such as panic disorder (sudden attack of autonomic nervous system hyperactivity account by fear of dying or going crazy and then change in behavior.), Generalized Anxiety Disorder or GAD (unreasonable anticipation anxiety in many things accompany with motor tension, autonomic nervous system hyperactivity and problems in concentration.), Post Traumatic Stress Disorder or PTSD (anxiety after faced of traumatic event accompany by re-experience symptoms such as nightmares, flashbacks, increase arousal and avoidance symptoms.) etc.

Medical personnel can help the patients through supportive approach and cultivation of positive attitude toward them. There are many factors that play a significant roles in successful physical rehabilitation outcome including support of the family and society, emotional well being, strong intention to cooperate in the program and good perception.[4]

Anxiety significantly affects the quality of life (QOL) and physical disability of stroke patients.[5-8] On the other hand, anxiety affects severity and duration of depression in stroke patients, which directly affect social function and ADL outcome.[9] In addition, anxiety inhibits physical recovery from stroke and limit QOL[10-11] and it is found that anxiety is associated with severe disability and poor social contact.[11]

From clinical experiences, stroke patients who attend physical rehabilitation programs are faced with many obstacles. Many of them are not cooperative in the program because of anxiety symptoms, that lead to poor rehabilitation outcome.

Many studies have been conducted in stroke in-patient units or in out-patient follow-up.[12-16] These studies showed association between anxiety and poor QOL, but there were no studies conducted in rehabilitation unit to measure ADL outcome of stroke patients.[17-19]

This study was conducted at the Physical Rehabilitation Unit to prove this association. The outcome of the study will allow us to create a useful strategies to approach stroke patients with positive attitude and understandings that lead to more effective rehabilitation outcome.

## Method

The patients were recruited when they were attending physical rehabilitation programs from June to December 2003. Inclusion criteria are: the patient is over 15 years old; being diagnosed as cerebrovascular disease with hemiparesis; having good consciousness, good orientation, and being able to communicate well in Thai language. Exclusion

criteria are, namely: having unstable medical conditions; having aphasia. In total, eighty-five patients were recruited in for clinical interview. The self- rating questionnaire, Thai version of Hospital Anxiety and Depression Scale (Thai-HADS) is used to detect anxiety when anxiety score is 11 or higher. Beand and Weinert, The Personal Resource Questionnaire : PRQ part II is performed by the patient to measure the level of the patient's supporting system. The patients who have PRQ part II score less than mean – 1SD are classified as poor supporting system group, if the score is between –1SD to +1SD the patients are classified as moderate supporting system group and if the score is above +1SD, the patients are classified as good supporting system group.

Medical information necessary for this study includes: age, sex, type of stroke (ischemic/ hemorrhagic), duration of stroke, location of brain lesion, and Barthel ADL index to classify the patient's ADL level are collected from medical records.

The data are analyzed by SPSS for Windows version 11. Descriptive statistics are reported. The levels of statistical significance of the relationship between various possible associated factors of the patients are evaluated in terms of chi-square test, t-test or ANOVA. The strength of association is summarized by correlation coefficient and Stepwise Multiple Regression Analysis is used to show significant association of the factors contributing to anxiety.

## Results

The results show that of the 85 stroke patients, 42 are male and 43 female. Their mean age is 59.77 years (SD = 14.43). Fifty-six patients (65.9 %) are married: 35 cases (41.2 %) are graduates from primary school and 36 cases are unemployed at the time of the study, and have no income.

More than half of the subjects (68 patients) have ischemic stroke and 66 patients (77.6 %) have subcortical brain lesions. Forty-six patients (54.1 %) have right-sided brain lesions, and thirty-nine patients (45.9 %) have brain lesion on the left side. The mean duration of illness is 15.11 months (SD= 32.53) and 61.2 % of the patients have duration of stroke more than 6 months.

Most of the patients (81.2 %) have no previous psychiatric disorder and only ten patients have previous anxiety disorders. Most of them (97.6%) have no family history of psychiatric illness, and only one patient has family history of anxiety disorder.

The assessment of ADL levels, reveals that, 49.4 % of the patients have mildly severe dependence ADL level; 18.8 % moderately severe dependence; 11.8 % severe dependence, and 20.0 % total dependence.

The mean score of Beand and Weinert, The Personal Resource Questionnaire: PRQ part II is 74.31 from 100 (SD= 21.17), and 60 % of the patients are classified in moderate supporting systems group, shown in table 1.

There are 21 patients (24.7 %) who are diagnosed with anxiety from Thai version of Hospital Anxiety and Depression Scale (Thai-HADS) score 11 or above. The mean score of all patients is 6.37 (SD = 4.85) and mean score in anxiety group is 14.33 (SD = 1.74).

The location of brain lesion (cortical or subcortical), side of brain lesion (right or left

**Table 1.** Characteristics of stroke patients who attend physical rehabilitation program (n=85).

| Patients Characteristics | Cases (%) | Patients Characteristics | Cases (%) |
|---|---|---|---|
| Sex | | Side of brain lesion | |
| Male | 42 (49.40) | Right | 46 (54.10) |
| Female | 43 (50.60) | Left | 39 (45.90) |
| Age group | | Duration of stroke | |
| ≤ 50 years | 22 (25.88) | ≤ 6 months | 52 (61.20) |
| 51-60 years | 13 (15.29) | > 6 months | 33 (38.80) |
| 61-70 years | 30 (35.29) | ADL level | |
| ≥ 71 years | 20 (23.54) | Mildly Severe Dependence | 42 (49.40) |
| (mean age=59.77, SD=14.43 | | Moderately Severe Dependence | 16 (18.80) |
| min = 21, max = 92) | | Severe Dependence | 10 (11.80) |
| Marital status | | Total Dependence | 17 (20.00) |
| Single | 10 (11.20) | Supporting system level | |
| Married | 56 (65.90) | Poor Supporting System | 15 (17.60) |
| Divorced | 9 (10.60) | Moderate Supporting System | 51 (60.00) |
| Spouse dead | 10 (11.20) | Good Supporting System | 19 (22.40) |
| Occupation | | | |
| Unemployed | 35 (42.40) | | |
| Labor | 8 (12.90) | | |
| Business | 16 (18.80) | | |
| Government | 8 (9.40) | | |
| Other | 14 (16.50) | | |

hemisphere), and type of stroke (ischemic or hemorrhagic) was found not associated with anxiety. Duration of stroke longer than 6 months is found associated with anxiety ($\chi^2$ = -2.847, P = 0.006), shown in Table 2. From ANOVA it is found that 4 levels of Barthel ADL index have statistical significant difference in anxiety score ($p < 0.01$) , and from Post Hoc Analysis discovers that patients who have mildly severe dependence ADL level have lower level of anxiety with statistical significant difference than those who have severe dependence and total dependence ADL levels, shown in Table 3.

The different levels of the patient's supporting systems show the different score of anxiety. From ANOVA it is found that all 3 levels of supporting systems have statistical significant difference in anxiety score ($p = 0.000$ ), and from Post Hoc Analysis it is found that patients who have poor supporting system show statistical significant difference of anxiety from moderate supporting system and good supporting system groups ($p < 0.05$), shown in Table 4. When analyzed in 5 subscales of supporting system (include social integration, assistance and guidance, opportunity for nurturance, self-worth and intimacy)

**Table 2.** Association between patient's characteristics and anxiety.

| Patient's Characteristics | Anxiety not found Cases (%) | Anxiety found Cases (%) | P value |
|---|---|---|---|
| Sex [a] | | | |
| Male | 33 (78.57) | 9 (21.43) | 0.616 |
| Female | 31 (72.09) | 12 (27.91) | |
| Age group [b] | | | |
| ≤ 50 years | 18 (81.81) | 4 (18.19) | 0.922 |
| 51-60 years | 9 (69.23) | 4 (30.77) | |
| 61-70 years | 21 (70.00) | 9 (30.00) | |
| ≥ 71 years | 16 (80.00) | 4 (20.00) | |
| Marital status [a] | | | |
| Single | 7 (70.00) | 3 (30.00) | 0.688 |
| Married | 41 (73.21) | 15 (26.79) | |
| Divorced | 7 (77.77) | 2 (22.23) | |
| Spouse dead | 9 (90.00) | 1 (10.00) | |
| Religion [a] | | | |
| Buddhism | 61 (75.30) | 20 (24.70) | 0.799 |
| Christ | 1 (100) | 0 (0) | |
| Muslim | 2 (66.66) | 1 (33.34) | |
| Education [a] | | | |
| None | 6 (75.00) | 2 (25.00) | 0.865 |
| Primary school | 24 (68.57) | 11 (31.43) | |
| Secondary school | 7 (77.77) | 2 (22.23) | |
| College | 17 (80.95) | 4 (19.05) | |
| Graduated | 8 (80.00) | 2 (20.00) | |
| Master degree | 2 (100) | 0 (0) | |
| Occupation [a] | | | |
| None | 26 (72.22) | 10 (27.78) | 0.784 |
| Labor | 10 (90.90) | 1 (9.10) | |
| Business | 12 (75.00) | 4 (25.00) | |
| Government | 6 (75.00) | 2 (25.00) | |
| Other | 10 (71.42) | 4 (28.58) | |
| Income (Baht/ month) [a] | | | |
| None | 26 (72.22) | 10 (27.78) | 0.077 |
| < 5000 | 10 (90.90) | 1 (9.10) | |
| 5000-9999 | 4 (50.00) | 4 (50.00) | |
| 10000- 14999 | 6 (60.00) | 4 (40.00) | |
| 15000- 20000 | 5 (71.42) | 2 (28.58) | |
| > 20000 | 13 (100) | 0 (0) | |

a= chi-square, b= t-test

**Table 2.** Continuous

| Patient's Characteristics | Anxiety not found Cases (%) | Anxiety found Cases (%) | P value |
|---|---|---|---|
| Previous Psychiatric Illness[a] | | | |
| None | 53 (76.81) | 16 (23.19) | 0.788 |
| Depression | 4 (66.66) | 2 (33.34) | |
| Anxiety disorder | 7 (70.00) | 3 (30.00) | |
| Psychiatric Illnessin Family[a] | | | |
| None | 62 (84.93) | 21 (15.07) | 0.715 |
| Schizophrenia | 1 (100) | 0 (0) | |
| Anxiety disorder | 1 (100) | 0 (0) | |
| Duration of stroke[a] | | | |
| ≤ 6 months | 44 (84.61) | 8 (15.39) | 0.006* |
| > 6 months | 20 (60.60) | 13 (39.40) | |

a= chi-square, b= t-test,

* $p < 0.01$

**Table 3.** Association between ADL level and anxiety by ANOVA.

| Factors | | x | SD | P value |
|---|---|---|---|---|
| Barthel ADL index | | | | |
| Mildly severe dependence | (n=42) | 4.02 | 1.98 | 0.000* |
| Moderately severe dependence | (n=16) | 7.19 | 2.23 | |
| Severe dependence | (n=10) | 9.00 | 1.72 | |
| Total dependence | (n=17) | 9.88 | 2.41 | |

* $p < 0.01$

**Table 4.** Association between supporting system level and anxiety by ANOVA.

| Factors | | x | SD | P value |
|---|---|---|---|---|
| Supporting System level | | | | |
| Poor supporting system | (n=15) | 11.27 | 3.27 | 0.000* |
| Moderate supporting system | (n=51) | 6.04 | 2.14 | |
| Good supporting system | (n=19) | 1.49 | 1.49 | |

* $p < 0.01$

with Pearson's Correlation Coefficient it is found that every subscale are significantly negative correlated with anxiety score ($p< 0.01$), shown in Table 5.

From Stepwise Multiple Regression Analysis found that all 3 factors include duration of stroke, ADL level, and supporting system were still statistically associated with anxiety at level $p< 0.01$, shown in Table 6. Duration of stroke can predict anxiety 7.4 %, then when combined with ADL level can increase predictive power of anxiety to 23.0 %,and when combined with the last factor, supporting system can increase predictive power of anxiety up to 30.2 %.

## Discussion

The prevalence of anxiety symptoms in this study is similar to those conducted in stroke in-patient unit and out-patient followed up clinic [8-17], but the association between duration of stroke and anxiety symptoms was not found in the other study [8]. This may be due to difference of population under study. It can simply explain the association by the fact that the longer the patients suffering from stroke, the more feeling of hopelessness the patients have, this directly raises the chance of failure, which in turn increases anxiety of the patients.

The association of ADL level and anxiety symptoms is similar to another study [5,9,10,12] which shows that anxiety is associated with lower level of ADL.

The result of reduction of the severity of anxiety symptoms according to supporting system is similar to that of Shimoda K. et al [9] and Bond J.[11]

**Table 5.** Correlation between supporting system subscale score and anxiety score.

| Supporting system subscale | Pearson's correlation coefficient | P value |
|---|---|---|
| social integration | -0.610 | 0.000* |
| assistance and guidance | -0.422 | 0.000* |
| opportunity for nurturance | -0.603 | 0.000* |
| self-worth | -0.576 | 0.000* |
| intimacy | -0.522 | 0.000* |

* $P< 0.01$

**Table 6.** Stepwise Multiple Regression Analysis for analyze factors associated with anxiety.

| Factors | R | $R^2$ | B | T | Sig. |
|---|---|---|---|---|---|
| Duration of stroke | 0.271 | 0.074 | 0.240 | 2.568 | 0.010* |
| ADL level | 0.479 | 0.230 | 0.144 | 4.079 | 0.000* |
| Supporting system level | 0.549 | 0.302 | -0.007 | -2.882 | 0.000* |
| constant | | | 0.326 | 1.664 | |

* $P<0.01$

However, in this study it is found that the location of lesions in the brain is not associated with anxiety. The larger proportion of patients who have subcortical brain lesions can explain by exclusion criteria that the patients who have aphasia were excluded.

There was no significant association found either between past psychiatric illness or family history of psychiatric illness with anxiety. This finding may result from very small number of patients in our study who have previous psychiatric illness and family history of psychiatric disorders.

## Conclusion

Anxiety in stroke patients was associated with longer duration of stroke, lower level of ADL, and poor supporting systems found among those who attend in physical rehabilitation program at King Chulalongkorn Memorial Hospital.

Medical personnel should be of more concern for the patients who can not well-cooperated in physical rehabilitation program after stroke, which may be caused of anxiety.

Collaborative approach between psychiatric and medical personnel may help the patient improved quality of life, and may increase the effectiveness of rehabilitation outcome. Positive attitude toward patients is always helpful to detect anxiety in stroke patients and provide them appropriate treatment.

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