

Received: 2018.05.08

Accepted: 2018.08.10

Published: 2018.09.06

Health Education Using Telephone and WeChat in Treatment of Symptomatic Uterine Myoma with High-Intensity Focused Ultrasound

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Source of support: Luzhou Municipal Science and Technology Bureau project (2016-S-67)**Background:** Adopting modern communication methods in traditional healthcare services is a trend of modern medicine. In this study we explored the value of telephone and WeChat in health education on uterine myoma by high-intensity focused ultrasound (HIFU).**Material/Methods:** A total number of 426 patients diagnosed with symptomatic uterine myoma from April 2017 to September 2017 were selected and randomly divided into a routine preoperative education group (175 patients) and a telephone/WeChat preoperative health education group (251 patients). The patients in the routine preoperative education group received routine preoperative education, whereas those in the telephone/WeChat preoperative health education group received telephone/WeChat preoperative health education. Patients were evaluated before and after treatment.**Results:** Compared with the routine preoperative education group, the patients in telephone/WeChat preoperative health education group had less preoperative and postoperative anxiety, less postoperative pain, and higher treatment satisfaction ($P < 0.05$).**Conclusions:** Health education using telephone and WeChat preoperatively can reduce preoperative and postoperative anxiety, postoperative pain, and early postoperative inflammatory response in patients with uterine myoma, and can improve treatment satisfaction.**MeSH Keywords:** Health Education • Leiomyoma • Radiosurgery**Full-text PDF:** <https://www.basic.medscimonit.com/abstract/index/idArt/911040>

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Background

Uterine myoma is a common, benign tumor of the female genitals. The incidence of this disease is increasing every year and it has a negative impact on physical and mental health of patients [1,2]. In the past, the main treatment of uterine myoma was surgery [3]. With the development of medicinal science, HIFU is now considered a safe, effective, noninvasive treatment method, and is widely used in curing this disease [4,5]. In recent years, with the rapid development of the internet and mobile apps, adopting internet technology in traditional medical care services is an inevitable trend of modern medicine [6,7]. However, the effect of using telephone and WeChat in the treatment of uterine myoma with HIFU remains unclear. Therefore, the purpose of this study was to explore the value of telephone and WeChat in preoperative health education in the treatment of uterine myoma with HIFU.

Material and Methods

Study population

We selected and enrolled 426 patients with symptomatic uterine myoma at the Affiliated Hospital of Southwest Medical University from April 2017 to September 2017. Inclusion criteria were: 1) age >18 years old; 2) patients had corresponding clinical symptoms; 3) uterine myoma was clearly visible under ultrasound; 4) tumor size was 3–10 cm; and 5) uterine myoma was confirmed by MRI. Exclusion criteria were: 1) patients with pregnancy or menstruation; 2) other malignant tumor; and 3) acute or uncontrollable other systemic diseases. Then, the 426 enrolled patients were randomly divided into a routine preoperative education group (Control group, n=175) and a telephone/WeChat preoperative health education group (Treatment group, n=251). Written informed consent was obtained from the participants before enrollment and the study was approved by the Affiliated Hospital of Southwest Medical University Health and Human Research Ethics Committee. The study was registered at (<https://www.researchregistry.com/register-now#home/>, Research Registry UIN: researchregistry4227).

Preoperative health education and nursing care

Patients in the Control group were given routine preoperative education, including psychological nursing, information on the disease and HIFU, and the possible complications after treatment. The specific method was as follows: on the 1st day before the surgical treatment, a professional, trained nurse provided face-to-face education to the patients about the disease and HIFU, the HIFU operation procedure, and possible situations arising during the operation. The nurse carried out the corresponding psychological guidance and gained the

patient's trust; therefore, the patients had full of confidence in the therapeutic effect of the HIFU. Patients in the Treatment group were given telephone/WeChat preoperative education, including psychological nursing, information about the disease and HIFU and the possible complications after treatment. The specific method was as follows. The telephone and WeChat education team was established and the team members included the head nurse, as well as the professional obstetrics and gynecology doctors and nurses. On the day before the surgical treatment, a nurse was trained to perform face-to-face patient education on the disease and HIFU, the HIFU surgical procedure and the possible situations during the operation for the patient, communicate with the patient, answer patient questions, carry out the corresponding psychological guidance, and gain the patient's trust so that the patient has full confidence in the therapeutic effect of HIFU. In addition, this preoperative education informed the patients and their families via telephone and WeChat twice 12 h later. For example, a training nurse introduced the HIFU as an effective non-invasive treatment for uterine myoma, and determined if the treatment effect was satisfactory compared with the traditional surgery, whether the treatment effect of HIFU was obvious, and whether the surgical trauma caused by HIFU was smaller and the pain was less after the surgery, and answered the patient's questions.

Therapeutic method

After the pre-scan, the focus was clearly showed, ultrasonic localization was performed, and the treatment area was selected. Each uterine myoma body was divided into several layers, with each layer was about 5 mm thick, from the point to line, from the line to surface, and from deep to shallow. According to the ultrasonic display, gray level point-by-layer and point-by-layer scan for treatment and the treatment was stopped according to the contrast-enhanced ultrasound. Treatment parameters: the firing frequency was 0.8MH, the focal length was 150 mm, and the treatment power was 350–400 W. In the treatment process, the patients were given mild sedation and analgesia (a small dose of midazolam and fentanyl), and the patient could communicate with the therapist at any time. The prophylactic antibiotics were not used before the treatment. According to the location, the myoma was divided into anterior or anterior uterine fundus (I) or posterior or posterior uterine fundus (II). According to the type, the myoma was divided into intramural myoma (IM) and non-intramural myoma, including submucous myoma (SS) and subserous myoma (SM).

Observation index

The anxiety assessment before and after treatment was performed as follows. On the second day before and the first day after treatment, the Hamilton Anxiety Scale (HAM-D) was used

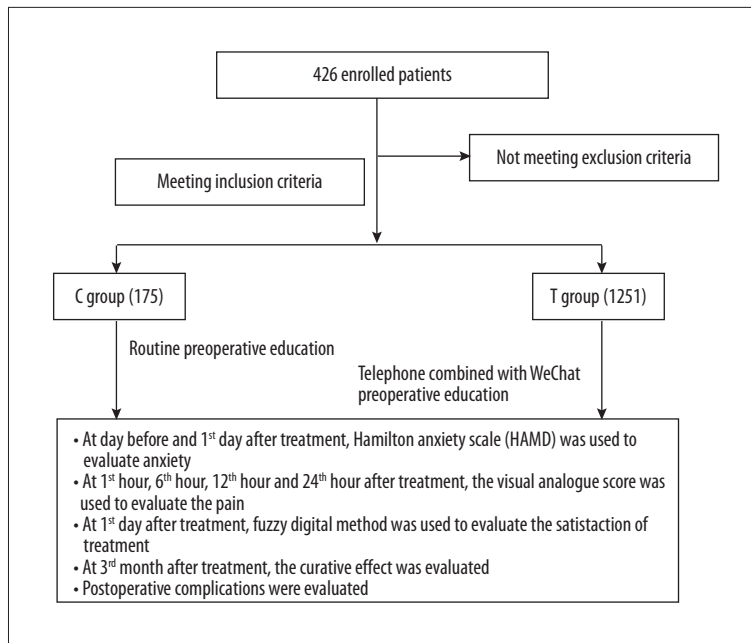


Figure 1. The flow chart of this study.

to evaluate anxiety. The patient was regarded as having serious anxiety when the total score was >29 ; if total score was $21\sim 28$, the patient had obvious anxiety; if total score was $14\sim 20$, the patient had anxiety; if total score was $7\sim 13$, the patient possibly had anxiety; and if total score was <7 , the patient had no anxiety. Pain was assessed at the 1 h, 6 h, 12 h, and 24 h after treatment; the visual analogue score was used to evaluate the pain with scores from 0 to 10 and a higher score indicated more obvious pain. Treatment satisfaction evaluation was performed as follows. On the first day after treatment, fuzzy digital method was used to evaluate treatment satisfaction with score from 0 to 10 points; the higher the score, the higher the satisfaction. Clinical effect evaluation was performed as follows. At 3 months after treatment, the tumor volumes of the 2 groups were compared, and the curative effect in the 2 groups was evaluated. The specific clinical efficacy evaluation criteria were as follows: Obviously effective – the decreased tumor volume was more than 80% and the B-ultrasound showed that the whole tumor echo was obviously enhanced; Effective – the decreased tumor volume was from 15% to 80%, and B-ultrasound showed that the whole tumor echo was moderately enhanced; Not effective – the decreased tumor volume was less than 15% and B-ultrasound showed that the whole tumor echo was not obvious.

Detecting serum inflammatory factors

On the second day before treatment, the first day before treatment, and at 1 h, 6 h, 12 h, and 24 h after treatment, 3 ml of venous blood was collected. Serum IL-1, IL-6, and TNF- α was detected using ELISA kits purchased from Beijing Tian Zhi Tai Biotechnology Co., Ltd., China.

Statistical analyses

All data were analyzed using SPSS 19.0. The data are presented as the mean \pm SD or n (%). The independent-samples *t* test was used for statistical analysis of the continuous data, the chi-square test was used for statistical analysis of the categorical data, and $P < 0.05$ was considered statistically significant.

Results

The mean age of the patients was 35.7 ± 9.2 years, the mean diameter of the myoma was 5.6 ± 1.1 cm, and the mean volume was 102.4 ± 11.3 ml in the Control group. The mean age of the patients was 34.2 ± 9.3 years, the mean diameter of the myoma was 5.8 ± 1.1 cm, and the mean volume was 96.3 ± 10.4 ml in the Treatment group. There was no significant difference in age, myoma diameter, or volume between the 2 groups. The flow chart of this study is shown in Figure 1.

Anxiety assessment before and after treatment in the 2 groups

On the 2nd day before treatment, there was no significant difference in anxiety scores between the 2 groups ($P > 0.05$); however, on the 1st day before and after treatment, compared with the Control group, the anxiety score of patients in the Treatment group was reduced ($P < 0.05$), as shown in Figure 2A.

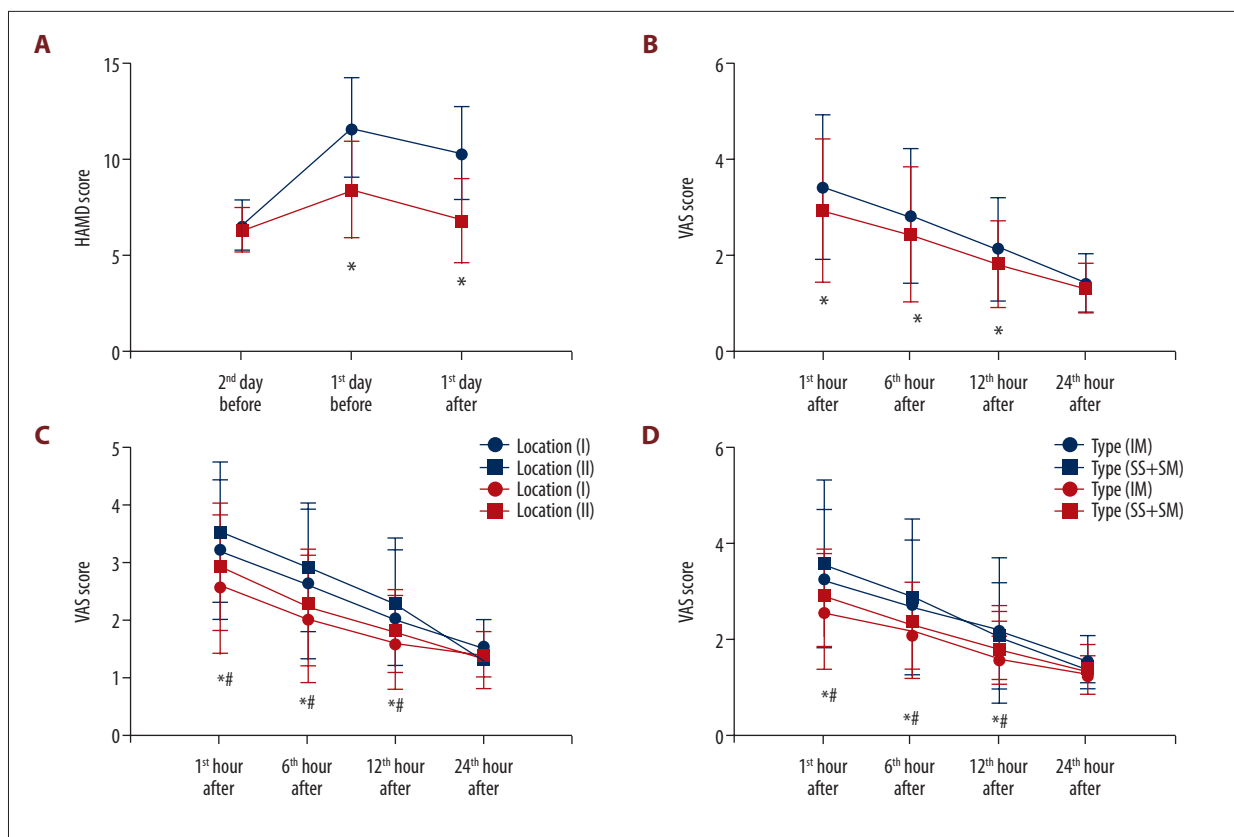


Figure 2. Anxiety and pain assessment in the 2 groups; (A) Anxiety assessment after treatment in the 2 groups; (B, C) pain assessment after treatment in the 2 groups; blue: Control group; red: Treatment group; location (I): anterior or anterior uterine fundus; type (IM): intramural myoma; location (II): posterior or posterior uterine fundus; type (SS+SM): submucous myoma (SS) and subserous myoma (SM); */# independent-samples *t* test, $P < 0.05$.

Pain assessment after treatment in the 2 groups

At 1 h, 6 h, and 12 h after treatment, compared with the Control group, the VAS score of the patients in the Treatment group was decreased ($P < 0.05$); however, there was no significant difference in VAS score between the 2 groups at 24 h after treatment ($P > 0.05$), as shown in Figure 2B. Similar results were also found in the 2 groups for the location and type of myoma, as shown in Figure 2C, 2D.

The levels of serum inflammatory factors in the 2 groups before and after treatment

At 1 and 2 days before treatment, there was no significant difference in the level of serum IL-1 or TNF- α in the 2 groups ($P > 0.05$); however, at 1 h, 6 h, 12 h, and 24 h after treatment, the serum IL-1 and TNF- α levels of the patients in the Treatment group were reduced compared with the Control group ($P < 0.05$), as shown in Figure 3.

Satisfaction evaluation in the 2 groups after treatment

At 1 day after treatment, the satisfaction rate of the Treatment group was increased ($P < 0.05$) compared with the Control group, as shown in Table 1.

Effect Evaluation in 2 groups after treatment

Compared with location (I) or type (IM), the total effective rate was reduced in location (II) and type (SS+SM) of these 2 groups, respectively. The total effective rate of the Control group was 93.1%, and the total effective rate of the Treatment group was 93.6%, but the total effective rate of the 2 groups was not significantly different ($P > 0.05$), as shown in Table 2.

Postoperative complications

After treatment, there was no significant difference in postoperative complications (e.g., fever, urinary retention, hematuria, skin burn, and abdominal wall edema) between these 2 groups, as shown in Table 3.

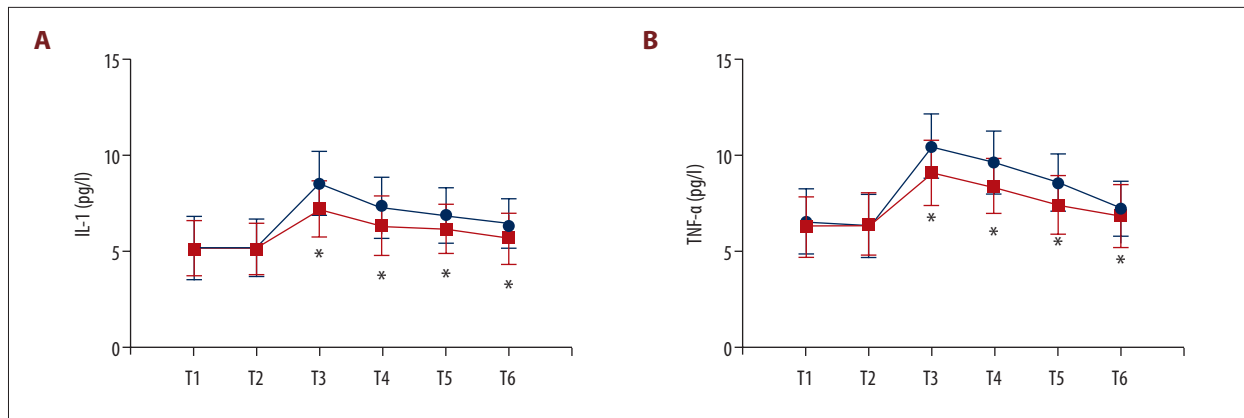


Figure 3. The levels of serum inflammatory factors in the 2 groups before and after treatment; A: IL-1 expression in blood; B: TNF- α expression in blood; blue: Control group; red: Treatment group; T1: 2 days before treatment; T2: 1 day before treatment; T3: 1 h after treatment; T4: 6 h after treatment; T5: 12 h after treatment; T6: 24 h after treatment; * independent-samples *t* test, $P < 0.05$.

Table 1. Satisfaction evaluation in the 2 groups after treatment.

Group	Number	Satisfaction score
Control group	175	9.1 \pm 1.6
Treatment group	251	9.5 \pm 1.4
P value		0.006

Independent-samples *t* test, $P < 0.05$.

Discussion

In this study, the telephone/WeChat method was used in the health education management of uterine myoma before treatment. The results showed that, compared with the

routine face-to-face preoperative health education, the telephone/WeChat preoperative health education did not affect the therapeutic effect of the HIFU in the treatment of uterine myoma. However, this method could reduce anxiety, pain, and inflammatory response before and after treatment, as well as improving patient satisfaction. The implementation of this research project verified the feasibility and application value of the Internet communication platform WeChat in the medical service industry, which warrants clinical application and promotion.

In this study, we found that the pre-operation health education method of telephone combined with WeChat could reduce the anxiety and improve the satisfaction of patients after

Table 2. Effect evaluation in different location and type after treatment.

Group	Number	Obviously effective	Effective	No-effective	Total effective rate (%)
Control group	175	145	18	12	93.1
Location	I	75	1	2	97.4
	II	70	17	10	89.6*
Type	IM	97	2	1	99.0
	SS+SM	48	16	11	85.3*
Treatment group	251	213	22	16	93.6
Location	I	105	1	1	99.0
	II	108	21	15	89.5*
Type	IM	129	1	2	98.4
	SS+SM	84	21	14	88.2*

* Compared with I, or IM, chi-square test, $P < 0.05$.

Table 3. Postoperative complications in the 2 groups.

Group	Fever	Urinary retention	Hematuria	Skin burn	Abdominal wall edema
Control group	1	1	0	2	18
Treatment group	2	2	1	3	35

treatment. A previous study has reported that the combined use of WeChat and mobile medical APP could alleviate anxiety and improve the quality of life of anxiety patients [8]. In addition, use of the mobile phone WeChat service was shown to improve adherence to corticosteroid nasal spray treatment in chronic rhinosinusitis patients after functional endoscopic sinus surgery [9]. In addition, the use of WeChat significantly increased the proportion of patients with successful cecal intubation and increased quality of colonoscopy [10]. The possible reasons for this effect were: first, better psychological counseling was performed for the patients; second, patients could continue to receive knowledge and improved understanding of the disease, the corresponding treatment process, complications, and other related aspects from the WeChat platform and the telephone; and third, patients have deeper trust and dependence on medical staff. Therefore, the telephone combined with WeChat pre-operation health education method is very important in the treatment of uterine myoma with HIFU; it can reduce patient anxiety before and after treatment and improve satisfaction with treatment.

In this study, we also found that pre-operation health education by telephone combined with WeChat method reduced pain at 1 h, 6 h, and 12 h in patients after treatment. Previous studies did not report any mechanism in this area. However, in the present study, we further examined the inflammatory response of the patients after the operation; the results showed the preoperative health education could reduce the expression levels of IL-1 and TNF- α in patients at 1 h, 6 h, 12 h, and 24 h after treatment. Previous studies have shown a close relationship between inflammation and pain, with high levels of inflammation being associated with more pain, which could be an independent risk factor causes pain, increasing the inflammatory response and leading to more pain, and there was a positive correlation between these 2 factors, which was also

consistent with our results [11,12]. In addition, psychoneuroimmunology research shows that psychological stress can acutely provoke increased inflammation in healthy individuals, and enhanced psychological functioning can reduce psychological stress and inflammatory cytokines, improving the prognosis of patients. In the present study, compared with routine preoperative education, telephone combined with WeChat preoperative health education further strengthened communication with patients [13–15]. Therefore, we considered that telephone combined with WeChat preoperative health education was a better psychological intervention that strengthens psychological functioning and reduces psychological stress and inflammatory cytokines. Therefore, we believe that telephone combined with WeChat preoperative health education can reduce the pain of patients after treatment, and the mechanism may be by reducing the inflammatory response.

In this study, the sample size was relatively small and we did not further explore the pain and the inflammatory response. Future studies with larger samples are needed to further verify the conclusions of this study.

Conclusions

In conclusion, the results show that telephone combined with WeChat preoperative health education can reduce preoperative and postoperative anxiety, postoperative pain, and early postoperative inflammatory response in patients with uterine myoma, and improves treatment satisfaction. We believe that this intervention warrants promotion in clinical practice.

Conflict of interest

None.

References:

1. Donnez J, Donnez O, Dolmans MM: The current place of medical therapy in uterine fibroid management. *Best Pract Res Clin Obstet Gynaecol*, 2018; 46: 57–65
2. Yen YS, Sun LM, Lin CL et al: Higher risk for meningioma in women with uterine myoma: A nationwide population-based retrospective cohort study. *J Neurosurg*, 2014; 120(3): 655–61
3. Taylor DK, Holthouser K, Segars JH, Leppert PC: Recent scientific advances in leiomyoma (uterine fibroids) research facilitates better understanding and management. *F1000Resm* 2015; 4(F1000 Faculty Rev): 183
4. Cheung VYT: High-intensity focused ultrasound therapy. *Best Pract Res Clin Obstet Gynaecol*, 2018; 46: 74–83
5. Schulman AA, Tay KJ, Robertson CN, Polascik TJ: High-intensity focused ultrasound for focal therapy: reality or pitfall? *Curr Opin Urol*, 2017; 27(2): 138–48
6. Berrouiguet S, Baca-Garcia E, Brandt S et al: Fundamentals for Future Mobile-Health (mHealth): A systematic review of mobile phone and web-based text messaging in mental health. *J Med Internet Res*, 2016; 18(6): e135

7. Cucciare MA, Weingardt KR, Greene CJ, Hoffman J: Current trends in using Internet and mobile technology to support the treatment of substance use disorders. *Curr Drug Abuse Rev*, 2012; 5(3): 172–77
8. Li XQ, Sun CF, Guo M: [Benefits of nursing care service in the assisted reproduction clinic to self-cycle-management and self-efficiency of infertility patients]. *Zhonghua Nan Ke Xue*, 2017; 23(6): 536–39 [in Chinese]
9. Feng S, Liang Z, Zhang R et al: Effects of mobile phone WeChat services improve adherence to corticosteroid nasal spray treatment for chronic rhinosinusitis after functional endoscopic sinus surgery: A 3-month follow-up study. *Eur Arch Otorhinolaryngol*, 2017; 274(3): 1477–85
10. Kang X, Zhao L, Leung F et al: Delivery of instructions via mobile social media app increases quality of bowel preparation. *Clin Gastroenterol Hepatol*, 2016; 14(3): 429–35 e3
11. Khan AN, Jacobsen HE, Khan J et al: Inflammatory biomarkers of low back pain and disc degeneration: A review. *Ann NY Acad Sci*, 2017; 1410(1): 68–84
12. Nimmo SM, Foo ITH, Paterson HM: Enhanced recovery after surgery: Pain management. *J Surg Oncol*, 2017; 116(5): 583–91
13. Rosenkranz MA, Lutz A, Perlman DM et al: Reduced stress and inflammatory responsiveness in experienced meditators compared to a matched healthy control group. *Psychoneuroendocrinology*, 2016; 68: 117–25
14. Fuchs F, Damm J, Gerstberger R et al: Activation of the inflammatory transcription factor nuclear factor interleukin-6 during inflammatory and psychological stress in the brain. *J Neuroinflammation*, 2013; 10: 140
15. Steptoe A, Hamer M, Chida Y: The effects of acute psychological stress on circulating inflammatory factors in humans: A review and meta-analysis. *Brain Behav Immun*, 2007; 21(7): 901–12