

## Original Article

# Integrated interventions for improving negative emotions and stress reactions of young women receiving total hysterectomy

Fen Wang<sup>1</sup>, Chun-Bo Li<sup>2</sup>, Shenghua Li<sup>3</sup>, Quan Li<sup>1</sup>

<sup>1</sup>Department of Anesthesia, Tenth People's Hospital Affiliated to Tongji University, Shanghai 200072, China; <sup>2</sup>Shanghai Mental Health Center, Shanghai Jiaotong University, Shanghai 200030, China; <sup>3</sup>Department of Anesthesia, Jiading Central Hospital, Shanghai 201800, China

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**Abstract:** 50% of women had obvious abnormal emotions before hysterectomy and hysterectomy can cause strong mental stress reaction. This study was to investigate the impact of psychological health education based integrated interventions on the preoperative negative emotions and stress of patients younger than 45 years receiving total hysterectomy. Forty patients undergoing total hysterectomy were randomly divided into psychological intervention (PI) group and control group (n=20 per group). Patients in PI received peri-operative psychological intervention (supportive psychotherapy, health education, individual depth psychotherapy, family and society supportive care, education on anesthesia and surgery etc.); Interventions were not used in control group. Hamilton Anxiety Scale and Hamilton Depression Rating Scale were used to evaluate patients in two groups on admission ( $T_1$ ) and before surgery ( $T_2$ ; after interventions in PI group). Serum levels of cortisol and IL-6 were detected at  $T_1$ ,  $T_2$  and the second day after surgery ( $T_3$ ). Results showed that 1) Patients had obvious anxiety and depression symptoms before and after total hysterectomy. For patients in PI group, the Hamilton Anxiety Scale (HAMA) score decreased from  $14.4 \pm 5.9$  to  $9.1 \pm 4.2$  and the Hamilton Depression Scale (HAMD) score from  $17.8 \pm 3.5$  to  $9.4 \pm 6.8$  after interventions; 2) In PI group, the serum cortisol was  $13.4 \pm 3.9$   $\mu\text{g/dl}$  at  $T_2$  and  $14.2 \pm 4.8$   $\mu\text{g/dl}$  at  $T_3$  which were significantly lower than that at  $T_1$  ( $16.6 \pm 4.0$   $\mu\text{g/dl}$ ) and that in the control group at  $T_2$  ( $13.4 \pm 3.9/15.5 \pm 4.3$   $\mu\text{g/dl}$ ,  $t=2.10$ ,  $P<0.05$ ). Thus, preoperative integrated intervention based on psychological health education can improve peri-operative negative emotions and psychological stress in young patients undergoing hysterectomy.

**Keywords:** Hysterectomy, interventions, negative emotion, randomized controlled trial, stress

## Introduction

Hysteromyoma is the most common benign tumor in women and frequently found in women aged 30-50 years [1]. Hysteromyoma is the major reason for hysterectomy [2]. Some investigators have shown that more than 50% of patients present with abnormal emotions before hysterectomy including anxiety and/or depression [3]. Hysterectomy is a potent stressor and may induce stress response in these patients. This study was undertaken to investigate the influence of integrated interventions before hysterectomy on negative emotions and psychological stress in hysteromyoma women receiving hysterectomy. On the basis of Accurate Expectancy Theory, we designed the integrated interventions based

on psychological health education. To exclude the influence of changes in ovarian function on the emotions and sexuality in women in the menopausal transition stage, patients younger than 45 years were recruited into the present study [4].

## Patients and methods

### Subjects

A total of 40 consecutive patients who received elective with hysterectomy due to hysteromyoma and were younger than 45 years were recruited from the Department of Gynecology, Affiliated Tenth People's Hospital of Tongji University from December 2011 to June 2012. The minimal age was 33 years and the mean

## Emotions improving and hysterectomy

**Table 1.** Baseline condition between PI and Control group

	Age	Education level			Menstrual cycle		Childbearing history		Sexuality	
		High-school and under	Unive- rsity	Master and above	Normal	Abnor- mal	One birth	Two births	Unsat- isfied	Satis- fied
PI (n=20)	43.6±2.4	6	11	3	12	8	17	3	7	13
Control (n=20)	42.9±2.1	7	12	1	14	6	18	2	5	15
<i>P</i> value	0.75		0.58		0.51		0.63		0.49	

age was 42±3 years. Inclusion and exclusion criteria were as follows: 1) Married women were not older than 45 years and their husbands were alive, the women and their husbands had no marital conflicts, and separated or divorced women were excluded; 2) Patients were pre-operatively diagnosed with hysteromyoma and received elective abdominal total hysterectomy. A history of ovarian diseases, malignant tumors and major gynecological surgery was excluded; 3) Other organic diseases were not observed; 4) Patients with ideological concerns were asked to enhance self-confidence and achieve sense of security. Patients had no history of mental illness or family history of Mental illness. 5) Patients had no history of cerebral diseases and mental retardation; 6) Patients had no drug or alcohol addiction, and were not treated with hormone within past 3 months; 7) patients had no history of anesthesia and surgical complications; 8) Major life events such as setbacks, disrupt and sufferings were excluded; 9) patients had stable source of income; 10) Illiteracy was excluded. Grouping: A total of 40 patients with hysteromyoma were randomly assigned with random number table into two groups: psychological intervention (PI) group and control group (n=20 per group). All patients received routine nursing and other clinical treatments during the hospitalization. From admission to before surgery (generally 4-7 days), integrated interventions on the basis of psychological health education were conducted in patients of PI group, but not in control group. Patients in PI group had comparable age, education level, menstrual cycle and sexuality to those in control group (**Table 1**).

### Procedures

For recruited patients, clinicians explained the study design on admission, and informed consent was obtained before study. At the same time, demographics and causes of anxiety were collected by questionnaire before surgery.

On admission ( $T_1$ ) and before surgery ( $T_2$ ), the first author who was trained employed HAMA and HAMD to evaluate these patients in a double-blind manner.

On admission ( $T_1$ ), before surgery ( $T_2$ ) and the second day after surgery ( $T_3$ ), venous blood (2 ml) was obtained and centrifuged. The serum was obtained and stored at -20°C. Radioimmunoassay was performed to detect the serum cortisol and IL-6.

All the patients received abdominal hysterectomy under endotracheal intubation and general anesthesia. After surgery, patient - controlled intravenous analgesia was conducted. Anesthesia and surgery were successfully performed and consistent among these patients. Anesthesia and surgery related complications were not observed in these patients.

On the second or third day after surgery, the causes of anxiety were collected again (after surgery).

Besides regular medical care and nursing contents, patients in PI group received integrated interventions based on health education (20-30 min per treatment), which was conducted by the first author before surgery. Patients in control group accept regular medical care and nursing contents only, and gynecologist would give some associated education and explanations to patients with scruple for hysterectomy.

### Integrated interventions

**Supportive psychotherapy:** Supportive psychotherapy was performed along the daily health care. In the present study, favorable doctor-patient relationship was established, clinicians patiently listened to what patients' said and encouraged patients to express their ideas and unbosom them. Explanation, encouragement, comforting, assuring and implying were employed to eliminate fear on surgery and hys-

terectomy, enhance their confidence and help them achieve the sense of security.

*Health education:* Health education was a major strategy in this study and focused on patients and their husbands. Health education was done in individual and group (2-3 patients) manners, and had following contents: 1) Education of basic knowledge: Concise and easy to understand words were used to explain the anatomy and physiology of reproductive organs, especially the uterus and ovary. Clinicians explained to patients that the loss of uterus only lead to lack of fertility, and total hysterectomy does not mean resection of ovary and has no influence on the endocrine function and feminine charm and can not cause virilence and accelerated aging. 2) Education of sexual health was done as follows: a: Clinicians encouraged patients to eliminate psychological barriers and enjoy the sexuality in a unrestrained manner. b: Clinicians explained the basic knowledge of sexual physiology and psychology and told patients that female orgasm is not only a response to stimulation but a product of the spirit. c: Clinicians encouraged patients and their husbands to communicate the sexual feelings and the way of caress and stimulation. d: Clinicians guided the patients and their husbands to explore and attempt more efficient sexual tips

*Education of knowledge on anesthesia:* Clinicians explained the surgery, rationale and procedures of anesthesia, potential intra-operative and post-operative complications, the pros and cons of post-operative analgesia, the environment of operating room and information of surgeons. In addition, cases with smooth recovery from surgery and post-operative analgesia were also introduced to patients, aiming to enhance their confidence.

*Family and social supportive psychotherapy:* This focused on their husbands or children for 1-2 times (15-20 min per time). The significance and method of surgery and post-operative care were explained to their husbands and guide their relatives to care patients emotionally and in daily life. Clinicians asked their relatives to care, encourage and comfort patients and gave warmth and confidence to patients. Once their husbands had apprehension on hysterectomy, the health education for husbands was then strengthened through more extra individual health educations.

*Individual psychotherapy in depth:* Ellis and Rational Emotive Therapy (RET) were done in patients with HAMA $\geq$ 14 or HAMD $\geq$ 17 on admission. According to the causes of apprehensions of patients, specific interview was done in individuals to strengthen the efficacy of interventions. Interview was done 2-3 times (15 min per time). At the same time, clinicians asked patients to lie on the bed calmly and comfortably. Patients experienced relaxation training under the guidance of clinicians once daily (10-15 min per time). Patients were asked to perform ambulatory activities as soon as possible after surgery.

### *Instruments*

We prepared scales to collect the demographics and causes of anxiety. The demographics included name, age, education level, occupation, income, menstrual cycle and sexuality. The causes of anxiety were divided into 12 types: 1 means presence and 2 means absence. The Hamilton Anxiety Scale (HAMA) [5] score of  $\geq$ 14 was used to define the presence of symptoms of anxiety. Previous studies showed this scale has favorable reliability and validity. Hamilton Depression Scale (HAMD [5]; Version 17) score of  $\geq$ 17 was used to define the presence of symptoms of anxiety.

### *Statistical analysis*

Student t test, analysis of variance, chi square test and correlation analysis were employed for statistical analysis.

## **Results**

### *Causes of anxiety on admission and after surgery*

On admission, more than half of patients in PI group and control group had causes of anxiety in the 1<sup>st</sup>, 2<sup>nd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> types. After surgery, the causes of anxiety in PI were mainly in the 3<sup>rd</sup> and 4<sup>th</sup> types; more than half of patients in control group had the causes of anxiety in the 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup> and 9<sup>th</sup> types. The correlation between causes of anxiety and scores of HAMA and HAMD were evaluated before and after surgery (**Table 2**).

### *HAMA and HAMD scores before and after surgery*

Analysis of HAMA score showed patients in both groups mainly presented with mental anxi-

## Emotions improving and hysterectomy

**Table 2.** Causes of anxiety and scores of HAMA and HAMD (*r*)

	PI group (n=20)				Controlled group (n=20)			
	HAMA		HAMD		HAMA		HAMD	
	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
Item 1	0.65*	0.12	0.58*	0.08	0.72*	0.14	0.54*	0.24
Item 2	0.50*	0.08	0.54*	0.25	0.57*	0.21	0.49*	0.28
Item 3	0.22	0.45*	0.17	0.46*	0.07	0.59*	0.17	0.07
Item 4	0.71*	0.48*	0.58*	0.20	0.68*	0.68*	0.47*	0.91*
Item 5	0.61*	0.07	0.55*	0.11	0.59*	0.59*	0.59*	0.85*
Item 6	0.59*	0.22	0.63*	0.29	0.50*	0.73*	0.68*	0.60*
Item 9	0.48*	0.30	0.52*	0.06	0.48*	0.49*	0.70*	0.47*
Item 10	0.50*	0.09	0.48*	0.19	0.65*	0.48*	0.59*	0.58*

\**P*<0.05, meaning statistical significance: Item 1: worry about success of surgery; Item 2: fear about intra-operative and post-operative pain or discomfort; Item 3: worry about high medical cost; Item 4: worry about the influence of surgery on health and daily life, and the reduction in physical capability; Item 5: worry about the influence of surgery on endocrine function and secondary sex characteristics (virilence); Item 6: worry about the compromised sexuality after surgery and influence of surgery on conjugal relation; Item 9: worry about accelerated aging; Item 10: worry about changes in temperament.

**Table 3.** Scores of HAMA and HAMD in two groups before and after interventions ( $\bar{X} \pm s$ )

Time/group	PI group (n=20)	Controlled group (n=20)
<b>HAMA</b>		
T <sub>1</sub>	14.4±5.9	14.1±3.4
T <sub>2</sub>	9.1±4.2**	14.2±4.8
<b>HAMD</b>		
T <sub>1</sub>	17.8±3.5	17.0±4.5
T <sub>2</sub>	9.4±6.8**	15.3±5.4

\*\*:*P*<0.01.

**Table 4.** Serum cortisol level in two groups before and after interventions

Time/group	PI group (n=20)	Controlled group (n=20)
T <sub>1</sub>	16.6±4.0	15.9±4.1
T <sub>2</sub>	13.5±3.9*	15.5±4.3
T <sub>3</sub>	14.2±4.8	14.3±5.7

\*:*P*≤0.05.

**Table 5.** Exchanges in IL-6 before and after PI ( $\bar{X} \pm s$ ) (ug/dl)

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
PI group (n=20)	115.0±43.2	93.9±40.1	98.4±39.7
Control Group (n=20)	116.1±33.1	120.3±85.7	101.734.3
t value	-0.09	-1.25	-0.28
P value	0.93	0.22	0.78

ety on admission. The scores of somatization of anxiety, sleep disorder, retardation, cognitive

impairment and changes in body weight reduced orderly. After interventions, the scores of HAMA and HAMD reduced significantly in PI group. However, the scores of HAMA and HAMD remained unchanged in control group (*P*<0.01). After intervention, the symptoms of anxiety and depression reduced markedly when compared with control group. In PI group, the scores of somatic anxiety and mental anxiety reduced significantly when compared with control group after evaluation with HAMA. In PI group, the scores of somatization of anxiety and sleep disorder decreased dramatically but the scores of body weight, retardation, sleep and cognitive disorder remained unchanged when compared with control group. In control group, the scores of above domains remained unchanged (**Table 3**).

### *Serum cortisol level in two groups before and after interventions*

In PI group, the serum cortisol level reduced when compared with control group after interventions. On the second day of surgery, the serum cortisol level remained unchanged (**Table 4**).

### *Serum IL-6 level in two groups before and after interventions*

In PI group, the serum IL-6 level remained unchanged at different time points, but was lower than that in control group on the second day of surgery (**Table 5**).

## Discussion

Hysterectomy may serve as a potent stimulus which has the possibility to cause psychological problem in patients and has negative influence on patients and their family [6]. Although some studies have been undertaken to conduct interventions in patients receiving hysterectomy, these studies focused on nurses in wards or operating room [7], and improve-

ment of pre-operative depression and anxiety and post-operative sexuality and quality of life [8, 9], and interventions on peri-operative stress are usually not specific and ineffective [10]. In the present study, patients receiving total hysterectomy due to hysteromyoma were recruited, and integrated interventions based on health education were conducted before surgery, aiming to improve the negative emotions and cognition, help these patients pull through the surgery and improve their quality of life. Our results may provide evidence for future application of psychological interventions in these patients.

### *Peri-operative psychology of young patients receiving hysterectomy*

Our results showed most of patients worried about the influence of surgery on health and that the surgery compromised the physical capability and influence their daily life. They also fear about that surgery affected the endocrine function and secondary sex characteristics (virilence). In addition, these patients worried about that surgery influenced the sexuality and conjugal relation, accelerated aging and changed dispositions. The worries on surgery and fear on hysterectomy caused heavy mental burden influencing their quality of life. However, few patients developed self-blaming, suicide and agitation. Beatrice et al [11] followed up 65 patients receiving total hysterectomy at 2 months and 8 months after surgery, and their results showed post-operative symptoms were closely associated with pre-operative anxiety, depression and hostility.

### *Health education improves negative emotions*

Active integrated interventions based on psychological health education were found to significantly improve the symptoms of depression and anxiety and sleep disorder. In addition, these interventions could help patients correctly understand the significance of hysterectomy, which then improved the somatic and psychological response of negative emotion. However, in control group, the scores of negative emotions and self-evaluation remained unchanged. Our findings further confirmed that psychological interventions might motivate patients and improve the relationship between clinicians and patients. The “active-passive” mode is changed into “guidance-cooperation” or “par-

ticipating together” mode. The psychological interventions may enable patients have potent motivations and methods to cooperate with medical staff. Our results were consistent with findings of Donoghue et al [12]. For patients with risk for negative influence by hysterectomy, interventions including attenuating pressure are usually effective, and also applicable in patients receiving other surgeries. Some clinicians postulate that psychological diagnosis and treatment by psychiatrist or psychologist before elective surgery are feasible, and pharmacotherapy and psychotherapy are effective to prevent post-operative psychological disorders [13].

### *Health education reduces serum cortisol level*

After interventions, the serum cortisol level was significantly lower than that in control group. This suggests that psychological interventions attenuate surgery induced stress and reduce the stress response, which was consistent with findings of Yuan et al [14]. Our results further demonstrated that the effectiveness of interventions was present before surgery and continued after surgery, and favorable psychology was beneficial for post-operative recovery.

### *Psychological interventions reduce serum IL-6 level*

IL-6 is a multifunctional cytokine and plays important roles in the growth, differentiation and production of immunoglobulins of B cells. In addition, IL-6 may induce the production and expression of IL-2 by T cells. The immunosuppressive effect of cortisol has been confirmed and widely accepted. Cortisol may reduce the lymphocytes and compromise the function of mononuclear phagocytes. Avila et al [15] found that the number of lymphocytes was related to the plasma glucocorticoid level. After psychological stimulation, the cortisol level is negatively related to IL-2 level, suggesting that stress may induce immunosuppression via increasing glucocorticoid level. However, our findings revealed that the IL-6 level remained unchanged in control group at different time points (on admission, after interventions and on the second day of surgery) and was comparable to that in PI group. This might be attributed to small sample size. Future studies are required to investigate the correlation between psychological stress and IL-6.

Taken together, clinicians should understand and pay attention to the psychological status and cognition of patients who are not older than 45 years and receive hysterectomy. Active integrated interventions based on health education may improve the peri-operative negative emotion, reduce psychological stress and promote post-operative recovery. Of note, patients in this study were investigated in a short time, and the long term effect of this strategy is required to be investigated in future studies. In addition, the influence of cognitive attitude of patients and relatives on related factors is needed to be elucidated.

### Disclosure of conflict of interest

None.

**Address correspondence to:** Dr. Quan Li or Fen Wang, Department of Anesthesia, Tenth People's Hospital Affiliated to Tongji University, No. 301 Middle Yanchang Road, Shanghai 200072, China. Tel: +86-21-66300588; E-mail: liquan0508@yeah.net; li091009@sina.com (QL); wangfen890@163.com (FW)

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