Preanesthetic maternal anxiety of 0 – 12 years old children who will undergo anesthesia and the contributing factors

Aries Perdana, Sarah Listyo Astuti, Andi Ade Wijaya Ramlan, Ratna Farida Soenarto and Tjhin Wiguna

1 Department of Anesthesiology and Intensive Care, Faculty of Medicine, Universitas Indonesia, Jakarta
2 Department of Psychiatry, Faculty of Medicine, Universitas Indonesia, Jakarta

E-mail: andi.ad@ui.ac.id

Abstract. Emotional stress, such as seen in preanesthetic anxiety, often occurs in parents and children who will undergo surgery and anesthesia. Preanesthetic anxiety is a subjective feeling associated with increased autonomic nervous system activity. Preanesthetic anxiety experienced by parents can be passed onto their children and have a negative impact on a child such as the occurrence of post anesthesia behaviour disorders. In Indonesia, data about preanesthetic maternal anxiety is still unavailable. The purpose of this study is to determine the proportion of preanesthetic maternal anxiety and the contributing factors.

After obtaining ethical approval from Health Research Ethics Committee of FKUI-RSCM, 144 mothers of children aged 0 – 12 years at preoperative clinic Dr. Cipto Mangunkusumo Hospital who were scheduled to undergo anesthesia, were interviewed using an anxiety disorders interview guide MINI (Mini International Neuropsychiatric Interview) ICD-10. The anxiety scores were assessed using the VAS (Visual Analogue Scale). Results were analyzed using multivariate logistic regression. A total of 70 mothers (48.6%) had anxiety disorders with VAS score ranging between 3-8 mm. Preanesthetic maternal anxiety is influenced by the child’s age (p = 0.001), history of previous anesthesia on the child (p = 0.004), and number of children (p = 0.041). Mothers with infants are 7.9 times more likely to experience higher anxiety (adjusted OR = 7.982), but because of the wide range of confidence interval (95% CI = 2.599 to 24.512) other factors may also influence the preanesthetic maternal anxiety. Preanesthetic maternal anxiety has fairly high proportion in numbers. This problem needs to be addressed to prevent a negative impact on children post anesthesia.

1. Introduction

Procedures such as surgery and anesthesia can cause a significant emotional stress to children and their parents, especially in the form of preanesthetic anxiety [1,2]. Many studies have shown the prevalence of parents’ preanaesthesia anxiety is as high as 42 – 47% [3,4]. Anxiety can be defined as a subjective feeling of tense, fear, anxious, worry, wary and associated with the increase of autonomic nervous system activity [1]. Preanesthetic anxiety is more often observed in the mothers, especially when the child is aged less than one year old or going through their first operating procedure [3,7]. It is understandable that women are more concerned with the risk and side effect that could happen during anesthesia [1].

Anxiety needs our special attention due to its effect on patient’s quality of life. Parents’ anxiety can pass onto the children and impact negatively on them in the form of post anesthesia behaviour.
disorders; with accompanying symptoms such as nightmares, general anxiety disorders, eating disorders, dysfunctional voiding, and temperament personality disorders [3,5,6]. Anxiety is not only affecting the child but also the child’s family [3]. A standard diagnostic instrument recommended by the World Health Organization (WHO) to detect psychiatric disorders, one of which is anxiety disorder, as categorized by DSM IV and ICD-10 is MINI (Mini International Neuropsychiatric Interview) Tool [8,9]. This tool can be used to diagnose preanesthesia anxiety. The intensity of the anxiety can be measured with various methods, among them is the Visual Analogue Scale (VAS). This method is practical and comparable to Spielberger’s State Trait Anxiety Inventory (STAI), as the gold standard for measuring anxiety [10,11].

Many studies had been conducted to identified risk factors and appropriate management for children’s preanesthetic anxiety, however, risk factors affecting parents’ preanesthetic anxiety haven’t been properly addressed. This study aims to find the proportion of maternal preanesthetic anxiety among the mothers whose child will undergo anesthesia procedure, and the predisposing risk factors.

2. Methods

Ethical clearance for this study was approved by Ethical Committee of Faculty of Medicine Universitas Indonesia. The study was conducted in preoperative clinic Dr. Cipto Mangunkusumo Hospital. There were 144 mothers of a child aged between 0 – 12 years who will undergo anesthesia have been informed and signed the research consent. The age of the mothers are between 20 – 49 years old.

| Variable                        | Number | Proportion (%) |
|---------------------------------|--------|----------------|
| **Child’s Age**                 |        |                |
| 0 - < 1 y.o.                    | 33     | 22.9           |
| 1 - < 3 y.o.                    | 49     | 34             |
| 3 - < 5 y.o.                    | 28     | 19.4           |
| 5 – 12 y.o.                     | 34     | 23.6           |
| **Child’s Gender**              |        |                |
| Male                            | 86     | 59.7           |
| Female                          | 58     | 40.3           |
| **History of Previous Anesthesia** |     |                |
| Yes                             | 67     | 46.5           |
| No                              | 77     | 53.5           |
| **Mother’s Education Level**    |        |                |
| Elementary Level                | 52     | 36.1           |
| Middle Level                    | 65     | 45.1           |
| Advanced Level                  | 27     | 18.8           |
| **Number of Children**          |        |                |
| One                             | 46     | 31.9           |
| Two                             | 52     | 36.1           |
| Three                           | 26     | 18.1           |
| Four                            | 8      | 6.6            |
| Five                            | 7      | 5.6            |
| Six                             | 5      | 3.5            |

After registered at preoperative clinic, the subject that met inclusion criteria were fill the form that consists of demographic data and five questions from SALT (Standard Anesthesia Learning Test) questionnaire. After filling the form, the mother would be interviewed using guideline from MINI (Mini International Neuropsychiatric Interview) ICD-10, gaining anxiety score ranging between 0 (not anxious) and 10 (very anxious) using VAS tool. After that, patients and their mother can proceed to preoperative clinic service according to hospital procedure. This study is cross sectional and using multivariate logistic regression methods for data analysis.
3. Results
Demographic characteristic of patients and their mother are as listed in table 1. Maternal education level was distributed unevenly, whereas mother with advanced education accounts only 18.8%.

3.1 Proportion of maternal preanesthesia anxiety
This study showed 70 mothers (48.6%) with preanesthetic anxiety (table 2). Through interview using MINI ICD-10, the majority experienced agoraphobic anxiety disorder (19.4%, n=28), followed by general anxiety disorder (16.7%, n = 24), panic disorder (6.9% n =10), and social anxiety disorder (5.6% n = 8). No mother presented with obsessive compulsive anxiety disorder. Mothers without anxiety disorder had VAS score ranging between 0 – 2.7 mm (average value 1.29 ± 0.65 mm) and those with anxiety disorder had VAS score at interval 3 – 8 mm (average value 4.69 ± 1.35 mm) (table 3).

Table 2. Types of maternal anxiety disorder using MINI ICD-10. (n = 70)

| Type of Maternal Anxiety Disorder | Number | Proportion (%) |
|----------------------------------|--------|---------------|
| Agoraphobia                      | 28     | 19.4          |
| Panic Disorder                   | 10     | 6.9           |
| Social Anxiety Disorder          | 8      | 5.6           |
| Obsessive Compulsive Disorder    | 0      | 0             |
| General Anxiety Disorder         | 24     | 16.7          |

Table 3. Average score and standard deviation of the VAS score.

| VAS Score | Anxiety Disorder | Average score (Mean) | Standard Deviation |
|-----------|------------------|----------------------|--------------------|
|           | Yes              | 4.69                 | 1.35               |
|           | None             | 1.29                 | 0.65               |

Table 4. Distribution of factors affecting pre-anesthetic maternal anxiety.

| Maternal Anxiety Disorder | Yes | None | p Value |
|---------------------------|-----|------|---------|
|                           | Number | Proportion (%) | Number | Proportion (%) | |
| Child’s Age               |        |                |        |                |         |
| 0 – < 1 y.o.              | 25     | 35.7           | 8      | 10.8           | 0.001*  |
| 1 - < 3 y.o.              | 27     | 38.6           | 22     | 29.7           |         |
| 3 - < 5 y.o.              | 9      | 12.9           | 19     | 25.7           |         |
| 5 – 12 y.o.               | 9      | 12.9           | 25     | 33.8           |         |
| Child’s Gender            |        |                |        |                |         |
| Male                      | 28     | 60             | 44     | 59.5           | 0.947   |
| Female                    | 24     | 40             | 30     | 40.5           |         |
| History of Previous Anesthesia |        |                |        |                |         |
| Yes                       | 24     | 34.3           | 43     | 58.1           | 0.004*  |
| None                      | 46     | 65.7           | 31     | 41.9           |         |
| Mother’s Education Level  |        |                |        |                |         |
| Elementary Level          | 23     | 32.9           | 29     | 39.2           | 0.066   |
| Middle Level              | 38     | 54.3           | 27     | 36.5           |         |
| Advanced Level            | 9      | 12.9           | 18     | 24.3           |         |
| Number of children (in person) |        |                |        |                |         |
| 1                         | 28     | 40             | 18     | 24.3           |         |
| 2                         | 19     | 27.1           | 33     | 44.6           | 0.041*  |
| 3                         | 13     | 18.6           | 13     | 17.6           |         |
| ≥ 4                       | 10     | 14.3           | 10     | 13.5           |         |
| Mother’s Knowledge in Anesthesia Procedure (using SALT Instrument) |        |                |        |                |         |
| Very Bad                  | 13     | 18.6           | 15     | 20.3           |         |
| Bad                       | 31     | 44.3           | 25     | 33.8           | 0.549   |
| Average                   | 14     | 20             | 21     | 28.4           |         |
| Good                      | 12     | 17.1           | 13     | 17.6           |         |

*Chi-square test
Factors that can precipitate the occurrence of preanesthetic anxiety are listed in Table 4. Number of children was proven to have effect on the incidence of maternal preanesthesia anxiety (p = 0.041). Likewise, the child’s age (p = 0.001) and history of prior anesthesia (p = 0.004). The larger part of the mother (84 samples) had lack of sufficient knowledge for anesthesia procedure; again, this may be because of most of the mothers participating in the study has low education level (Table 4).

Table 5. Significance of factors affecting pre-anesthetic maternal anxiety.

|                              | B    | Sig. | Adjusted OR | 95% C.I for a OR |
|------------------------------|------|------|-------------|-----------------|
|                              |      |      |             | Lower           | Upper           |
| **Number of Children**       |      |      |             |                 |                 |
| 1                            | .186 | .750 | 1.205       | .384            | 3.786           |
| 2                            | -.604| .295 | .547        | .176            | 1.694           |
| 3                            | .158 | .803 | 1.171       | .337            | 4.071           |
| ≥ 4                          |      |      |             |                 |                 |
| **Child’s Age**              |      |      |             |                 |                 |
| 0 - <= 1 y.o.                | 2.077| .000 | 7.982       | 2.599           | 24.512          |
| 1 - <= 3 y.o.                | 1.228| .013 | 3.414       | 1.297           | 8.987           |
| 3 - <= 5 y.o.                | .291 | .611 | 1.338       | .436            | 4.108           |
| 5 – 12 y.o.                  |      |      |             |                 |                 |
| **No History of Previous Anesthesia** | .877 | .017 | 2.404       | 1.166           | 4.956           |

We found that the younger the child is, the more prone the mother to experience anxiety, in this case mothers with less than one year old infant child had 7.9 times higher risk in developing anxiety rather than those with children aged between 5 – 12 years old (adjusted OR = 7.982) (Table 5). From Table 5 we can also see that when the adjusted OR is greater than 1 concluded as the most significant. In factor ‘number of children’ for samples with 2 children had adjusted OR less than 1 (0.547). It doesn’t mean that this factor has no role in affecting the incidence of preanesthetic maternal anxiety but it clearly has less impact than if the child aged less than one year old, which had a bigger adjusted OR value (7.982).

4. Discussions

This study is a pilot study for parents’ preanesthetic anxiety in Indonesia. The proportion of preanesthetic anxiety in this study is higher than the previous studies; in this case the cultural and religious factors may influence study’s result as the majority of Indonesian children are being nurtured by the mothers. This parenting pattern fosters a close relationship and inner bond between a mother and her children. As the main caregiver mother will be anxious about all the unpleasant possibilities if the child is going through an invasive procedure under anesthesia. The faith to God and the obedience with their religion will affect mother’s acceptance thus influence preanesthetic maternal anxiety. However, these factors hadn’t been investigated profoundly in this study.

Children with their first anesthesia experience associated with higher occurrence of anxiety on the mothers [3,4,6,7]. This may be because lack of previous references about anesthesia, related to the advantages, risk factors, and possible complications the child would experienced. Child’s age affecting maternal anxiety as the younger the child, incidence of mother anxiety would be higher. In this study mothers with child aged less than one year old showed higher incidence of anxiety. However, the higher a mother’s education level, reduce preanesthetic anxiety incidence. The mother with higher education level will thoroughly understands the advantages and complication of the anesthesia by searching for references or literacies. The distribution of level of education is not event, associated
with many patients seeking treatment to this general hospital are mainly from middle to low education level.

This study was using translated SALT questionnaire that had been modified and validated to match our respondent’s qualification. This study showed inadequate knowledge about surgery and anesthesia procedure. Low education level and limited access to information related to surgery and anesthesia may contribute to this finding. However, there were no significant differences of education level in mothers experiencing anxiety and those who didn’t. Many ethnic groups in Indonesia with paternalistic patterns still believes that sons are more valuable than daughters. Thus we were expecting higher preanesthetic anxiety in mothers whose sons were going through anesthesia. However, this study shows none significant impact of gender on preanesthetic maternal anxiety. This finding is consistant accordingly with other overseas studies findings that there is no role of gender in predisposing parents’ preanesthetic anxiety [3].

This study was not designed to tell apart whether the maternal anxiety came from the surgery or the anesthesia procedure.

5. Conclusions
This study shows high proportion of preanesthetic maternal anxiety, therefore it requires appropriate intervention to manage maternal anxiety thus preventing negative outcomes in post anesthesia children. Preanesthetic maternal anxiety can be affected by child’s age, history of previous anesthesia, and the number of children in the family.

6. References
[1] Kain Z N and Fortier M 2011 Smith's Anesthesia for Infants and Children 8th ed Davis P J et al Philadelphia Elsevier Mosby pp 265-76
[2] Krane E J, Davis P J and Kain Z N 2011 Smith's Anesthesia for Infants and Children 8th ed Davis P J et al Philadelphia Elsevier Mosby pp 277-92
[3] Shirley PJ, Thompson N, Kenward M and Johnston G 1998 Parental anxiety before elective surgery in children: A British perspective Anesthesia 53 956-9
[4] Thompson N, Irwin M G, Gunawardene M S and Chan L 1996 Preoperative parental anxiety Anesthesia 51 1008-12
[5] Kain Z N 1999 Perioperative information and parental anxiety: The next generation Anesth Analg 88 237-9
[6] Ahmed M I, Farrell M A, Parrish K and Karla A 2011 Preoperative anxiety in children risk factors and non-pharmacological management M.E.J. Anesth 21 153-66
[7] Litman R S, Berger A A and Chhibber A 1996 An evaluation of preoperative anxiety in a population of parents of infants and children undergoing ambulatory surgery Paed Anesth 6 443-7
[8] Chen T, Chang S, Tsai C and Juang K 2004 Prevalence of depressive and anxiety disorders in an assisted reproductive technique clinic Human Reproduction 19 2313-18
[9] Mukhtar F et al 2012 A preliminary study on the specificity and sensitivity values and inter-rater reliability of Mini International Neuropsychiatric Interview in Malaysia ASEAN Journal of Psychiatry 13
[10] Kindler C H, Harms C, Amsler F, Ihde-Scholl T and Scheidegger D 2000 The visual analog scale allows effective measurement of preoperative anxiety and detection of patients’ anesthetic concerns” Anesth Analg 90 706-12
[11] Jalal H A, French J L, Foxall G L, Hardman J G and Bedforth N M 2010 Effect of preoperative multimedia information on perioperative anxiety in patients undergoing procedures under regional anaesthesia BJA 104 369-74

Acknowledgement
The authors would like to thank the Department of Anesthesiology and Intensive Care Cipto Mangunkusumo Hospital and Universitas Indonesia for supporting this study.