INCIDENCE AND EFFECTS OF LIFE STYLE FACTORS IN PREMENSTRUAL SYNDROME AMONG COLLEGE STUDENTS IN TAMILNADU

Neethu Ros Tom[1]*, Hanna Alexander[1], Swethalekshmi V.[1], Greeshma Hanna Varghese[1], T. R. Ashok Kumar[2], T. Sivakumar[2]

[1]Pharm. D, Nandha College of Pharmacy, Erode.

[2]Department of Pharmacy Practice, Nandha College of Pharmacy, Erode.

*Correspondence for Author

Neethu Ros Tom

Pharm. D, Nandha College of Pharmacy, Erode.

ABSTRACT

Pre-Menstrual Syndrome (PMS) is defined as the recurrence of psychological and physical symptoms in the luteal phase, which remit in the follicular phase of the menstrual cycle. The incidence of severe PMS or PMDD (Pre-menstrual dysphoric disorder) appears to be 5 to 8%. The study was taken up to know incidence of PMS within the reproductive age and to describe the correlation of PMS symptoms with BMI, physical activity, calcium intake and nutritional status. The incidence of the PMDD was found to be 11.62% and PMS was found to be 38.75%. Abdominal pain (82.17%), mood swing (62.01%) and breast tenderness (45.73%) were significantly more in young women.

The mean body mass index of the study participants were 22.25(1.82) and mean age was 21.85 years which was significantly related with PMS. Participants taking calcium regularly were 8 those shows positive correlation in reduction of PMS and 29 were reported with positive family history of premenstrual syndrome. participants were taking analgesics followed by antispasmodic 19.37%, anti-diarrhoeal 1.55% ,antacid 3.10% ,laxative 0.77%,The common non pharmacological treatment used were hot drinks 3.87% ,massage therapy 1.55%, exercise and others 17.05%. Lack of nutritional supply and calcium intake increases the incidence of PMS. In conclusion the PMS has a negative impact on women's quality of life, hence necessary awareness and education by healthcare professionals can improve the recognition and management of these common conditions by providing patient education on premenstrual symptoms and counselling women on lifestyle interventions and pharmacotherapy to relieve their discomfort.

KEYWORDS: Premenstrual syndrome, Pre-menstrual dysphoric disorder.

INTRODUCTION

Premenstrual syndrome (PMS) is the name given to a collection of physical and psychological symptoms that most women experience during the late luteal phase of each menstrual cycle (7 to 14 days prior to menstruation). The symptoms of which fall into three domains: emotional, physical, and behavioural. The most common emotional and mood-related symptoms of PMS include depression, irritability, tension, crying, over sensitivity (hypersensitivity), and mood swings with alternating sadness and anger. Physical discomforts include abdominal cramps, fatigue, bloating, breast tenderness, acne and weight gain. Behavioural symptoms include food cravings, poor concentration, social withdrawal, forgetfulness and decreased motivation.[1] The reported prevalence of moderate to severe PMS varies between 3% and 30%, depending on the population studied, and is likely to be under reported, especially by the ethnic minorities. The incidence of severe PMS or PMDD (Pre-menstrual dysphoric disorder) appears to be 5 to 8%. PMS appears less prevalent in women who are on hormonal contraception, of normal weight and perform exercise.[2]

OBJECTIVE

This is the study to assess the Incidence and effects of life style factors in premenstrual syndrome among college students in Tamilnadu. The study was taken up to know incidence of PMS within the reproductive age and to describe the correlation of PMS symptoms with BMI, physical activity, calcium intake and nutritional status.

MATERIALS AND METHODS

The survey study was conducted to find the incidence of PMS among college students in Dr.mgr University, Tamilnadu. Participants who filled the informed consent form were enrolled for the study and brief information about the purpose was explained to them. Ethical requirements were met during the conduction of the research. The obtained information and the identities of participants were kept confidential. All the undergraduate students who are at reproductive age were included in to the study and currently pregnant and irregular menstrual cycle were excluded from the study. Participation was voluntary and no participant was enforced to answer the questionnaire. PMS was assessed by the PMS Self Evaluation Questionnaire (PEQ) and PMDD was assessed by DSM-IV-TR research criteria. All data obtained were analyzed using the Microsoft Excel software. Descriptive analysis was

performed on all the variables to obtain the frequency and percentage, followed by chi square test. A p-value of < 0.05 was considered significant.

RESULTS

A semi-structured and self-administered questionnaire was used for data collection. The questionnaire contained demographic characteristics of the study participants, their gynaecologic and obstetrics profiles and possible symptoms of PMS assumed to be developed that were gathered from different literatures.

The collected data were checked for completeness and accuracy and corrected on daily basis before being filled. Data were coded and edited properly by the principal investigator prior to data entry.

From the information gathered with the feedback questionnaires it is emphasized that PMS is common in women. Total of 129 female students of college of health science, Dr.MGR Medical University were enrolled into the study.

The response rate was 86.43% and 50 participants were with premenstrual syndrome. A total of 10 were excluded from the study due to irregular menstrual cycle.

The mean age of participants was 21.85(SD = 1.36) years. The mean body mass index of the study participants were 22.25(1.82). Among the study participants, 18 started menstruations at the age of 13-15 years followed by the age of 11 - 13 years were 31 and less than 10 years was 1.Thus the mean age of menarche was 12.35(S.D 1.22) years. The mean duration of number of bleeding day was found to be 4–5 days. And 29 were reported with positive family history of premenstrual syndrome.

Out of 50 participants, about 10 were doing exercise regularly, 8 occasionally and 32 were without exercise. In this study, 2 of the participants are reported to have social habit (alcohol/smoking).we observed that participants taking calcium regularly and occasionally were 8 and 31 respectively and who did not consume calcium was 9.

There was a significant relation between calcium intake and premenstrual syndrome. It was found that 9 were taking highly nutritious food and 41 were not taking regularly.

Table 1: patient demographics and other parameters regarding premenstrual syndrome

Parameters	cases	controls	Chi square	P value	Level of significance
Age, years 15-20 20-25 >25 Mean age(SD)	8 (6.20) 40 (31.00) 0 21.85(1.36)	31 (24.03) 49 (37.98) 1 (0.77) 21.47(1.7)	7.52	0.2322	0.05 Significant
Body mass index <20 21-25 >25 Mean BMI(SD)	4 (3.10) 40 (31.00) 6 (4.65) 22.25(1.82)	21 (16.27) 58 (44.96) 0 (0.00) 21.9(1.75)	15.11	0.000523	0.05 Significant
Age at menarche, years >10 11-13 >13 Mean menarche(SD)	1 (0.77) 31 (24.03) 18 (13.95) 12.35(1.22)	5 (3.87) 64 (49.61) 10 (7.75) 12.43(1.27)	10.42	.005454	.05 Significant
No of bleeding days 2 3-5 >5 Mean (SD)	5 (3.87) 39 (30.23) 6 (4.65) 4.52(1.14)	0 (0.00) 67 (51.93) 12 (9.30) 4.46(1.09)	8.29	0.015795	.05 Significant
Family history of PMS Yes No	29 (22.48) 21(16.27)	33 (25.58) 46 (35.65)	3.23	0.0722	Not significant
Physical activity Daily Occasionally No	10 (7.75) 8 (6.20) 32(24.80)	5 (3.87) 21 (16.27) 53 (41.08)	6.49	0.03894	.05 Significant
Smoking /alcohol status Yes No	2 (1.55) 48 (37.20)	0 79 (61.24)	3.20	0.0732	Not significant
Calcium intake Regularly Occasionally Without	10 (7.5) 31 (24.03) 9 (6.97)	8 (6.20) 45 (34.88) 26 (20.15)	4.78	0.056	0.05 Significant
Nutritional status Regularly Occasionally	9 (6.97) 41 (31.78)	15 (11.62) 64 (49.61)	0.0197	0.888	0.05 not Significant

Severity of the PMS was assessed by the PMS Self Evaluation Questionnaire (PEQ).Mild PMS symptom was scored as minor that not interfering routine daily activities. Moderate PMS symptoms which interfering routine daily activities and Severe PMS symptoms were symptoms hindering participation in any activity. In our study, mild PMS was found in 30 (23.25%) girls. Frequency of moderate and severe PMS was19 (14.72%) and 1 (0.77%) respectively.

Table 2: Severity of Premenstrual syndrome

Severity	Freq(n)	Percentage (%)
No PMS	79	61.24
Mild	30	23.25
Moderate	19	14.72
Severe	1	0.77

Although PMS and PMDD criteria share affective and somatic symptoms, more symptoms are required for a PMDD diagnosis, and symptoms often are more severe. On diagnosis of PMDD was done by the DSM-IV-TR research criteria for PMDD. The incidence of the PMDD was found to be in 15 (11.62%) participants from the total population who had suffered with higher degree of affective and somatic symptoms whereas the incidence of PMS was found to be 50 (38.75%).

The study revealed that 106(82.17%) subject having lower abdominal pain, 41 (31.78%) nervous tension, 80 (62.01%) mood swings, 68 (52.71%)irritability, 35 (27.13%) anxiety , 8 (6.2%) weight gain , 7(5.42%) swelling in extremities, 59 (45.73%) Breast tenderness, 51 (39.53%) headache, 34(26.35%) craving for sweets, 34 (26.35%) increased appetite, 28(21.70%), heart pounding, 80(62.01%) fatigue, 41(31.78%) dizziness, 31(24.03%) depression, 13(10.07%)forgetfulness, 25(19.37%) crying, 18(13.95%) confusion, 41(31.78) insomnia.

We observed that abdominal pain (82.17%), mood swing (62.01%) and breast tenderness (45.73%) were significantly more in young women .Of these, 31 had mild abdominal pain and 43 had severe abdominal discomfort. The least symptom reported was the Swelling in extremities (45.73%) which was 7, 0 and 0 in mild, moderate and severe.

Table 3: Symptoms of PMS

Symptoms	Mild Freq (%)	Moderate Freq (%)	Severe Freq (%)	Total Freq (%)
Abdominal pain	31 (24.03)	31 (24.03)	43 (33.33)	106(82.17)
Nervous Tension	29 (22.48)	7 (5.42)	4 (3.10)	41(31.78)
Mood Swings	34 (26.35)	21(16.27)	24 (18.60)	80(62.01)
Irritability	30 (23.25)	22(22.05)	13(10.07)	68(52.71)
Anxiety	17(13.17)	10(7.75)	8(6.20)	35(27.13)
Weight Gain	8(6.20)	0	0	8(6.20)
Swelling of Extremities	7 (5.42)	0	0	7(5.42)
Breast Tenderness	19 (14.42)	22 (17.05)	18 (13.95)	59(45.73)
Headache	18 (13.95)	22 (17.05)	11(8.52)	51(39.53)
Craving for Sweets	24(18.60)	8(6.20)	2(1.55)	34(26.35)

Increased Appetite	20(15.50)	10 (7.75)	4 (3.10)	34(26.35)
Heart Pounding	23(17.82)	3(2.32)	2(1.55)	28(21.70)
Fatigue	14(10.85)	35 (27.13)	21 (16.27)	80(62.01)
Dizziness or Fainting	24 (18.60)	15(11.62)	2 (1.55)	41(31.78)
Depression	25(19.37)	4 (3.10)	2 (1.55)	31(24.03)
Forgetfulness	12 (9.30)	1 (0.77)	0	13(10.07)
Crying	7(5.42)	16(12.40)	2 (1.55)	25(19.37)
Confusion	11(8.52)	5(3.87)	2 (1.55)	18(13.95)
Insomnia	12(9.30)	23 (17.82)	6 (4.65)	41(31.78)

However, we found that 70% participants had received treatment for PMS, which was symptomatic self medication and 30% were not taking medication.

Table 4: Treatment of PMS

Treated for PMS	Freq.	Percentage
Yes	35	70%
No	15	30%
Types of PMS treatment	**With PMS**	**Without PMS**
Non pharmacological		
Hot drinks like coffee	5 (3.87)	10 (7.55)
Massage	2 (1.55)	4 (3.10)
Exercise and others	22 (17.05)	44 (34.10)
pharmacological	24 (18.60)	48 (37.20)

Majority of 27.13% participants were taking analgesics followed by antispasmodic (19.37%), anti-diarrhoeal (1.55%) ,antacid(3.10%) ,laxative(0.77%),The common non pharmacological treatment used were hot drinks 5(3.87%),massage therapy2(1.55%), exercise and others 22(17.05%).
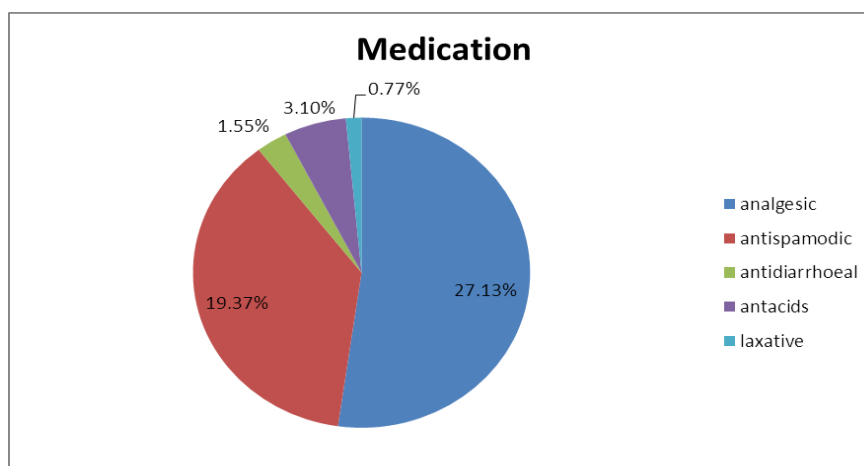

Fig 1: Pharmacological Treatment of PMS

DISCUSSION

The cyclic recurrence of distressing emotional, physical and behavioural symptoms not due to organic or underlying psychiatric disease in the luteal phase of the menstrual cycle which

subsides with the onset of menstruation comprises of the premenstrual syndrome. The severity of these symptoms varies as is judged according to the interference with activities of daily life and interpersonal relationships.[3,4]

The incidence of PMS in our study is 38.75 whereas in other available results from UAE, USA, France report incidence of PMS between 16.4% to 35%, while Cleckner Smith and Johnson reported very high prevalent figures of 75% and 88% respectively.[5,6] The frequency of PMDD in a study by nusrat nizar was 5.8%, which was lower than reported frequency by Tabassum and by Perkonigg that is 18.2% and 20.4% respectively. It is similar to the frequency reported by Duester, which is different from our study where the incidence of PMDD is 15 (11.62%).[7] Altered luteinizing hormone pulse, abnormalities in thyroid hormone, cortisol, prolactin, glucose, prostaglandins, β-endorphins and vitamins cause abnormality in hypothalamo-pitutary gonadal (HPG) axis that may result in mood disturbances.[8]

The mean age of participants in our study was 21.85(SD = 1.36) years which is different from other study where the mean age is 24.3 years.[9] The mean body mass index of the study participants were 22.25(1.82) and is similar to a study by Soo-Ho Chung et. al where the mean BMI of the participants is 22.406.[10] Among the study participants, 18 started menstruations at the age of 13-15 years followed by the age of 11 - 13 years were 31 and less than 10 years was 1and the mean age of menarche was found to be 12.35(SD 1.22) and the mean duration of number of bleed days was found to be 4-5 days which is similar to a study by navdeep kaur where 221 (89.11%) had menarche at 12-15 years of age and 186 (75%) had duration of menstrual cycle 4-5 days[11] which i is also similar to other study by Tolossa et. al which says that 111(64.2%) started.

Menstruation at the age of 13-15 years and menstrual duration was 4–5 days (56.2%).[10] And 29 (22.48%) were reported with positive family history of premenstrual syndrome and is different from a study by Nusrat Nisar which says that 58.6% of the participants had the family history of PMS (5).

In a study by Tolossa and Bekele found that the most commonly reported physical symptoms with PMS were abdominal bloating, 141(81.5%) where as in our study most commonly reported symptom is that having lower abdominal pain 106subject (82.17%) 41 (31.78%) nervous tension, 80 (62.01%) mood swings, 68 (52.71%) irritability, 35 (27.13%) anxiety, 8

(6.2%) weight gain, 7(5.42%) swelling in extremities, 59 (45.73%) Breast tenderness, 51 (39.53%) headache, 34(26.35%) craving for sweets, 34 (26.35%) increased appetite, 28(21.70%) heart pounding, 80(62.01%) fatigue, 41(31.78%)dizziness,31(24.03%) depression,13(10.07%)forgetfulness, 25(19.37%) crying, 18(13.95%) confusion, 41(31.78%) insomnia. According to research done in Jinnah Medical & Dental College Karachi from July 2009 to September 2009 , the most prevalent symptoms among the medical students all above 50%, were increased appetite (67.5%), worry and anxiety (60%), tired or lethargic (54%) felt suddenly sad/ tearful (56.5%), interpersonal conflict (54%) and depressed mood (52.5%) (10, 11). The research done in College of Medicine, King Faisal University, also showed that the most frequently reported symptom was abdominal bloating (75.3%).[12] in other study by Antai A the most commonly reported was severe abdominal pain, followed by pimples/puffy face, tender/painful breasts, depression/tension, tiredness, joint/muscle pain increased appetite, headache, weight gain, backache, and common cold.[9]

In a study by Myint Thu et.al states that a total of 41% of the respondents had symptoms with mild severity that is the symptoms were present but not a problem and did not interfere with daily functioning. But 53% reported moderate PMS symptoms with significant discomfort. 6% of the respondents reported severe PMS symptoms interfering daily function but in our study, mild PMS was found in 30 (23.25%) girls and frequency of moderate and severe PMS was19 (14.72%) and 1 (0.77%) respectively.[15] Sibel et.al in a study analysed that 79% (301) of subjects were found to show moderate and high levels of PMS symptoms. Demir and colleagues (2006) have found that 91.7% of the women in their study experienced some symptoms during their premenstrual cycles.[16]

Regular moderate aerobic exercise has been shown in epidemiological studies to be associated with less severe premenstrual symptoms. In the single randomized trial, a group of sedentary women with PMS were randomly assigned to regular walking or continuation of usual activity for 6 months .The active group reported fewer symptoms at the end of the trial. A reasonable initial regimen for sedentary women is 30 minutes of brisk walking five times a week.[17] Dietary supplements in the form of calcium, vitamin B6 & soy isoflavones may found to decrease the symptoms of PMS in a study by Shruti Brahmbhatt which is similar to our study where women taking calcium regularly found to have decreased PMS (1). Our study states that high intake of calcium decreases the risk of PMS or by another words we can say that incidence of PMS is increases with low calcium intake. The evidence states that lack

of nutritional supplements decreases the risk of PMS symptoms. But it is not shown this study due to small sample size.

In a study by Tolossa et. al states that 48.50% of participants took treatment for PMS. The common type of treatment used by participants with PMS symptoms were pain killers like aspirin and ibuprofen 63(36.4%) and hot drinks like coffee and tea 13(7.5%); the others being massage therapy, yoga, exercise and applying heat around pelvic area and in our study majority of (27.13%) participants were taking analgesics followed by antispasmodic (19.37%), anti-diarrhoeal (1.55%) ,antacid(3.10%) ,laxative(0.77%),The common non pharmacological treatment used were hot drinks 5(3.87%),massage therapy2(1.55%), exercise and others 22(17.05%).[14] Approaches for PMS treatment have been developed invarious fields. Symptom relief has been demonstrated with regular exercise, self-care, and a well-balanced healthy diet. In addition, the education of patients, families, and friends and application of methods for reducing stress and increasing social support are important. While this approach is not primarily for the specific treatment of PMS, it does aid in supporting the overall health of the patient. Drug treatment with oral contraceptive pills, prostaglandin inhibitors, and spironolactone has also been used, 2 although medication should not be a first-line treatment.[10]

The role of caffeine in premenstrual symptoms is unclear. Observational studies have found that women who report the most severe premenstrual symptoms also report the highest caffeine intake, but it is unclear whether the caffeine is causative, aggravates existing symptoms, or is actually being used as self-treatment for the common symptoms of fatigue and reduced concentration. A trial of reducing or eliminating caffeine for several cycles is reasonable. The role of sodium is purely anecdotal and probably derives from the belief that the symptoms of bloating and weight gain are due to salt or at least can be improved by reducing its intake. As with caffeine, it may be reasonable to have women experiment with reducing dietary salt, but to continue this practice only if improvement is noted.[18] The limitation of the study is that this study was conducted in a small population.

CONCLUSION

This study on premenstrual syndrome in college students revealed a higher incidence of 38.75% which is alarming, while the incidence on Premenstrual Dysphoric Disorder showed an incidence of 11.62%. The most common physical PM symptom is abdominal pain and the mood swing. In most of the cases PMS was found to be higher in subjects with low dietary

calcium and other nutritional intake. The non pharmacological therapy to relieve symptoms adopted by most of the students was exercise and the pharmacological therapy was by analgesics and anti-spasmodic. In conclusion the PMS has a negative impact on women's quality of life, hence necessary awareness and education by healthcare professionals can improve the recognition and management of these common conditions by providing patient education on premenstrual symptoms and counselling women on lifestyle interventions and pharmacotherapy to relieve their discomfort.

REFERENCE

1. Shruti Brahmbhatt*, B. M. Sattigeri, Heena Shah, Ashok Kumar, Devang Parikh. A prospective survey study on premenstrual syndrome in young and middle aged women with an emphasis on its management. International Journal of Research in Medical Sciences. 2013; 1(2): 69-72.

2. Joshi JV, Pandey SN, Galvankar P, Gogate JA. Prevalence of premenstrual symptoms: preliminary analysis and brief review of management strategies. Journal of mid-life health 2010; 1:30-4.

3. Dennerstein L, Lehert P, Bäckström TC, Heinemann K. The effect of premenstrual symptoms on activities of daily life. Fertil Steril., 2010; 94: 1059-64.

4. Dennerstein L, Lehert P, Keung LS, Pal SA, Choi D. Asian study of effects of premenstrual symptoms on activities of daily life. Menopause Int., 2010; 16: 146-51.

5. Nusrat Nisar, Nishat Zehra, Gulfareen Haider, Aftab Afroz Munir,Nisar Ahmed Sohoo. Frequency, intensity and impact of premenstrual syndrome in medical students. Journal of the College of Physicians and Surgeons Pakistan., 2008; 18(8): 481-484.

6. Johnson SR. The epidemiology and social impact of premenstrual symptoms. Clin Obstet Gynecol, 1987; 30: 367-76.

7. Deuester PA, Adera T, South-Paul J. Biological, social and behavioural factors associated with pre-menstrual syndrome.Arch Fam Med., 1999; 8: 122-8.

8. Halbreich U. The etiology, biology, and evolving pathology of premenstrual syndromes. Psychoneuroendocrinology., 2003; 28(3): 55-99.

9. antai a.b, udezi, a.w, ekanem, e.e.okon, umoiyoho a.u. premenstrual syndrome: prevalence in students of the university of calabar, Nigeria. African Journal of Biomedical Research, 2004; 7: 45-50.

10. Soo-Ho Chung, Tae-Hee Kim, Hae-Hyeog Lee, Arum Lee1, Dong-Su Jeon, Junsik Park, Yesol Kim. Premenstrual Syndrome and Premenstrual Dysphoric Disorder in Perimenopausal Women. Journal of Menopausal Medicine., 2014; 20: 69-74

11. Navdeep Kaur, Ramesh Thakur. A descriptive study to assess the premenstrual syndrome and coping behaviour among nursing students. Nursing and Midwifery Research Journal, jan 2009; Vol-5.

12. Fikru Wakjira Tolossa, Mebratu Legesse Bekele.Prevalence, impacts and medical managements of premenstrual syndrome among female students: cross-sectional study. BMC Women's Health., 2014; 14: 52.

13. Mahesh A, Zubair S, Tirmizi A, Ali SS: Frequency and associated factors of Premenstrual Syndrome in Medical College Girls. Med Channel., 2011; 17(1): 34–38.

14. Balaha MH, El Monem Amr MA, Al Moghannum MS, Al Muhaidab NS: The phenomenology of premenstrual syndrome in female medical students:a cross sectional study. Pan Afr Med J., 2010; 5: 4.

15. Myint Thu, Edessa Ore-Giron Diaz and Sawhsarkapaw. Premenstrual Syndrome among Female University Students in Thailand. AU J.T., Jan. 2006; 9(3): 158-162.

16. Sibel Oztürk,Derya Tanrıverdi , Behice Erci . premenstrual syndrome and management behaviours in turkey. australian journal of advanced nursing., 28(3): 98-101.

17. Prior JC, Vigna Y, Sciarretta D, et al. Conditioning exercise decreases premenstrual symptoms: a prospective, controlled 6-month trial. Fertil Steril., 1987; 47: 402-8.

18. Freeman EW, Stout AL, Endicott J, Spiers P. Treatment of premenstrual syndrome with a carbohydrate-rich beverage. Int J Gynaecol Obstet., 2002; 77: 253-4.