Research Article

Compatibility between Menstrual Pictogram Assessment and Haemoglobin Assessment in Abnormal Uterine Bleeding

Uji Kesesuian Pemeriksaan Piktogram Menstruasi dengan Pemeriksaan Hemoglobin pada Pasien Perdarahan Uterus Abnormal

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Abstract

Objective: To determine the amount of wasted blood and diagnosed AUB and determine amount of decrease in haemoglobin levels by adjusting the examination of menstrual pictogram with haemoglobin.

Methods: Diagnostic test was conducted in the Department Obstetrics and Gynecology Dr. Mohammad Hoesin/Faculty of Medicine Universitas Sriwijaya Palembang, start from January 2015 through January 2017. Sample was obtained from 39 patients with abnormal uterine bleeding who meet the inclusion and exclusion criteria. Frequency and distribution of data are described in tables and cross analyze (cut-off point) to find cut points difference menstrual pictogram and a decrease in haemoglobin levels using ROC curve. Accuracy is measured by the value of Kappa. Data analysis using SPSS version 21.

Results: From 39 samples that obtained, majority characteristics age > 35 years (59%), ideal BMI (59%) and multiparous (48.7%). From statistical analysis, there was significance association between haemoglobin measurement tools and menstrual pictogram (p = 0.063). Both measuring devices have compatibility in predicting the type of AUB (p = 0.047), with the degree of conformity is weak (Kappa = 0.232).

Conclusion: Accuracy of menstrual pictogram examination and haemoglobin has a weak degree of conformity, so menstrual pictogram examination can't be used to determine a decrease in haemoglobin levels. Menstrual pictogram menstruation only used as an evaluation of therapeutic response.

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Keywords: abnormal uterine bleeding, haemoglobin, menstrual pictogram

Abstrak

***Tujuan**: Untuk mengetahui jumlah darah yang terbuang dan dapat menegakkan suatu diagnosis PUA dan mengetahui jumlah penurunan kadar hemoglobin dengan cara menyesuaikan pemeriksaan piktogram dengan pemeriksaan hemoglobin.*

***Metode**: Uji diagnostik ini dilakukan di Departemen Obstetrik dan Ginekologi RSUP Dr. Mohammad Hoesin/Fakultas Kedokteran Universitas Sriwijaya Palembang mulai Januari 2015 sampai Januari 2017. Didapatkan sampel sebanyak 39 pasien perdarahan uterus abnormal yang memenuhi kriteria inklusi dan eksklusi. Frekuensi dan distribusi data dijelaskan dalam bentuk tabel dan dilakukan analisis titik potong (cut off point) untuk mengetahui titik potong selisih piktogram dan penurunan kadar hemoglobin menggunakan kurva ROC. Nilai akurasi diukur dengan nilai Kappa. Analisis data menggunakan SPSS versi 21.*

***Hasil**: Dari 39 sampel didapatkan mayoritas memiliki karakteristik berusia > 35 tahun (59%), IMT ideal (59%) dan multipara (48,7%). Dari analisa statistika adanya hubungan signifikan antara alat pengukuran hemoglobin dan piktogram (p = 0,063). Kedua alat ukur memiliki kesesuaian dalam memprediksi jenis PUA (p = 0,047), dengan derajat kesesuaian lemah (Kappa = 0,232).*

***Kesimpulan**: Akurasi pemeriksaan piktogram dan pemeriksaan hemoglobin memiliki kesesuaian lemah, sehingga pemeriksaan piktogram ini tidak dapat digunakan untuk mengetahui penurunan kadar hemoglobin. Piktogram menstruasi hanya dapat digunakan sebagai evaluasi respon terapi.*

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***Kata kunci**: hemoglobin, perdarahan uterus abnormal, piktogram menstruasi*

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INTRODUCTION

Abnormal uterine bleeding includes all of the menstrual abnormalities both in amount and duration. Clinical manifestations may be a lot or a little bleeding, elongated or irregular menstrual cycles. This terminology is replaced by the current menorrhagia, which is a lot menstrual bleeding or heavy menstrual bleeding (HMB) where the amount of bleeding of > 80 ml during the menstrual cycle and blood only contribute as much as 50%. While abnormal uterine bleeding caused by coagulopathy factors, local hemostasis disorders endometrium and ovulation disorders that were previously included in dysfunctional uterine bleeding (DUB).[1-3]

Based on the HIFERI consensus (2013) in Bogor, it has been agreed that the definition of normal menstruation is a physiological process which occurs bleeding, mucus and cellular debris from the uterus periodically at regular intervals that occurred since menarche to menopause with the exception of pregnancy and breastfeeding, which is the result of harmonic regulation of hormonal organs.[2,4,5]

Based on International Federation of Gynecology and Obstetrics (FIGO) there are nine major categories were prepared in accordance with the acronym "PALM-COEIN".The classification system is based on the consideration that a patient may have one or more factors causing abnormal uterine bleeding. With this approach, management for AUB patients can be more comprehensive.[1,2,6-9]

Management of abnormal uterine bleeding in general, doctor needs to take account into age, marital status, fertility, weight, type and duration of bleeding, underlying disease and prognosis.[10,11]

First treatment for abnormal uterine bleeding is stabilized the patient, cessation of bleeding using sex steroid hormones (estrogen, progestin and androgen), inhibitors of prostaglandin synthesis, antifibrinolytic and operative treatment.[3,4,7,10]

To determine the severity of bleeding in a clinical examination is often difficult. For example, some studies have reported a lack of correlation between the patient's perception of the amount of bleeding by the amount obtained from objective calculation. When the method of estimation is subjectively compared to the objective, 38-76% of women who suffer from menorrhagia obtained from objective estimation method. Many factors influence the patient's perception of the amount of bleeding, among others, menstruation duration, age, number of used pads, amount of blood loss and circumstances that may affect the amount of blood loss. Higham and Shaw stated that there's a relationship between height, age, parity and the amount of bleeding, but still needed an objective measurement.[12]

Another method to estimate the amount of blood loss can be done by estimating the amount and type of pads used by a woman during menstruation This chart is called the Pictorial Blood Assessment Chart (PBAC) was first introduced by Higham et al. in 1990 in the form of visual inspection with a value of scoring. Total score more than 100 points each menstrual cycle, meaning the loss of the amount of bleeding more than 80 ml. Validity of PBAC has been studied, debated and reported that the study had a 86% sensitivity and specificity of 89% and had been observed that 74% of anaemia caused by menorrhagia.[12-14]

Janssen et al. modify PBAC techniques to create a menstrual pictogram or scale of "bleeding" by calculating the number of millilitres of blood was found in sanitary napkins, tampons, blood clots and spots of blood on the underwear. Menstrual pictogram have a higher accuracy rate than the PBAC for every shape and size have different numbers of absorption pads. These menstrual pictograms were developed to create a simulation by performing dilutions balanced between blood whole blood and 0.9% saline solution and using "Kotex" branded pads, day and night type.[12,15,16]

Month: _____

	Pads			Tampons			Clots		Flooding	Score
Date	Light (1 pt each)	Medium (5 pts each)	Heavy (20 pts each)	Light (1 pt each)	Medium (5 pts each)	Heavy (10 pts each)	5 cent size (1 pt each)	50 cent size (5 pts each)	1 pt each episode	
1										
2										
3										
4										
5										
6										
7										
8										

PBAC Scoring System

Pads		
1 point	For each lightly stained pad	
5 points	For each moderately stained pad	
20 points	For each completely saturated pad	
Tampons		
1 point	For each lightly stained tampon	
5 points	For each moderately stained tampon	
10 points	For each completely saturated tampon	
Clots/Flooding		
1 point	For each small clot (Australian 5 cent coin)	
5 points	For each large clot (Australian 50 cent coin)	
5 points	For each episode of flooding	

Figure 1. Pictorial Blood Assessment Chart (PBAC)

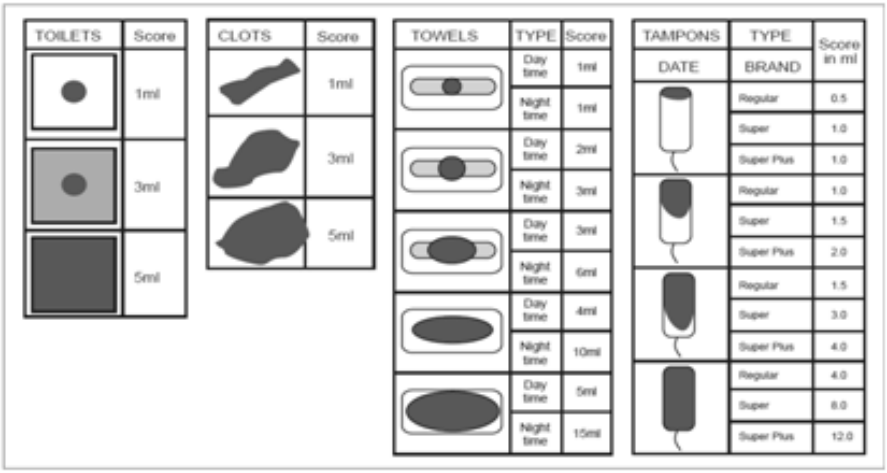

Figure 2. Menstrual Pictogram

METHODS

This study is a diagnostic test with an observational analytic design performed on 39 women with abnormal uterine bleeding. This research was conducted in Department of Obstetrics and Gynecology Dr. Mohammad Hoesin Hospital, Palembang during January 2015 - January 2017. Inclusion criteria were patients diagnosed with AUB, not being pregnant, not undergoing treatment of infertility, and willing to participate in the study and signed informed consent.

Patients who refused to participate in the study, history of surgical uterine (<6 weeks), complication with other diseases (kidney, liver, hypertension, cancer, diabetes mellitus, ectopic pregnancy), hemodynamically unstable, were excluded from the study.

All patients who met the inclusion criteria then collected basic data including: identity, gestational age, parity, the first day of last menstrual period (LMP), reproductive status physical examination, gynecology and laboratory tests. Then patient is given a branded napkin "kotex" (day and night type) and was given a menstrual pictogram chart that has been taught how to fill it out and still be evaluated by researchers. After seven days (depending on the state of the patient) re-evaluation carried out by way of summing over the use of pads and a blood clot and conduct laboratory tests.

Data were analysed using SPSS software version 21.0; descriptive data will be analysed using Fisher exact test, the cut off point inspection of menstrual pictogram and haemoglobin will be displayed through the image of the curve Receiving operating characteristic (ROC), sensitivity, specificity, and to assess the degree of compliance with Kappa test.

RESULTS

The demographic characteristics of the study sample are presented in Table 1. Table 1 Based note that the majority of the sample has characteristic aged > 35 years (59%), ideal BMI (59%), multiparous (48.7%).

Table 1. Demographic Characteristics (n = 39)

Characteristics	n	%
Aged (year)		
< 25	3	7.7
25-35	13	33.3
> 35	23	59
	38.2 ± 1.107	
IMT		
< Underweight	4	10.3
Ideal	23	59
> Overweight	12	30.8
	22.5794 ± 3.51335	
Parity		
Nullipara	15	38.5
Primipara	5	12.8
Multipara	19	48.7
Diagnosis		
PUA ec PALM COEIN	39	100

Compliance Pictogram Assessment and Haemoglobin Assessment in AUB Patients

Table 2 showed no significant relationship between haemoglobin measurement tools and pictograms (p = 0.063). However, the second measuring instrument has its suitability in predicting the type of AUB (p = 0.047), with the degree of conformity is weak (Kappa 0.232).

Table 2. Compliance Pictogram Assessment and Haemoglobin

AUB	Hb≤1.35		Hb>1.35	
	n	%	n	%
Pictogram ≤ 678	3[a]	12.5	6[b]	35.29
Pictogram > 678	21[c]	87.5	9[d]	52.94
	24	100	17	100

Fisher exact test, p = 0.063
Kappa test = 0.232; p = 0.047

Table 2 shows as much as 65.4% (a + d) examination gives the same results (concordance). While as much as 122.79% (b + c) give different results (Discordant). Compliance of examination is not 65.4%, due to the conformity is bias. After correction of accidental factors, researchers obtained pure conformity (Kappa value) of 0.23158. Because the researchers wanted a minimum Kappa was 0.46, the examination pictogram with haemoglobin is weak, so these tests can not be used to determine a decrease in haemoglobin levels in AUB patients.

Analysis of Accuracy or Compliance Pictogram Examination with Haemoglobin

ROC analysis on Haemoglobin difference with AUB, Haemoglobin difference is not significant in predicting the occurrence AUB with p = 0.054. Difference in haemoglobin cannot be used as single predictor of AUB.

The cut off point difference in haemoglobin in AUB patients, where a decrease in haemoglobin of 1.35 able to predict AUB events with 0.818 sensitivity and specificity of 0.5.

ROC analysis a pictogram difference in the incidence of PUA, pictogram difference was not significant in predicting the occurrence AUB with p = 0.087. Pictograms difference can not be used as a predictor of AUB. The cut off point of difference pictograms in AUB patients, as the reduction of 678 pictograms able to predict AUB with specificity and sensitivity 0.394 and 0.667.

DISCUSSION

Abnormal uterine bleeding (AUB) is defined as an increase in menstrual frequency, duration or amount of blood loss. Abnormal uterine bleeding may be caused partly by the growth of neoplasms, hormone dysfunction, trauma, infection, coagulopathy, and complications of pregnancy.[7,17]

In this study, the largest age group is > 35 years (59%), followed by the age group 25-35 years (33.3%), then <25 years (7.7%). The incidence of AUB 19.1% of all visits for gynecological cases, about 10-30% women in reproductive age and over 50% of perimenopausal women (Haynes, 1977). Research conducted by Harlow et al. on menstrual cycle length, reveals that the number of population variability menstrual cycle length immediately after menarche and just before menopause. According to Jukic et al., age is a major factor that led to changes in the length of the menstrual cycle. Cycles will be shorter at the time between early menopause and then in the mid to late menopausal transition. Meanwhile, according to Deligeoroglou et al., in adolescence, prevalence is ~ 20%, the primary mechanism involved is anovulation, due to lack of maturation of the hypothalamic-pituitary-gonadal.[18-21]

In this study, incidence AUB affected most to the ideal BMI (59%), while IMT > average (30.8%). Results of this study is together with Beno et al., 2010, which found that there is a relationship between overweight and dysfunctional uterine bleeding (DUB) (p: 0.024), but after the test statistics, variable parity does not have a significant effect on the occurrence of DUB (p for bivariate and multivariate > 0.05).[22-25]

Most parities in this research were multiparas 19 (48.7%). Rifki et al. showed that of the 51 cases studied, parity observed in multiparous women with as many as 34 (66.67%). Ichimura et al., shows nullipara women have a high risk for the occurrence of uterine myoma, whereas multiparous women have decreased relative risk for the occurrence of uterine myoma. In multiparous with children, more than five are at risk only 0.2% for uterine myoma. According to Munro et al., 2011, endometrial polyp, are common benign lesions, asymptomatic pathogenesis, but can also contribute to a regular menstrual or abnormal uterine bleeding.[7,18]

Uterine adenomyosis usually occurs in older age compared with uterine myoma, which is between 40-50 years. The incidence is not related to parity. More than 80% of women with uterine adenomyosis have other pathological processes in the uterus; 50% of patients with uterine myoma, an estimated 11% with endometriosis cyst, and 7% of cases with polyps. Bird et al. reported on the case of uterine adenomyosis 51.2% of patients complained a lot of bleeding, 10.9% irregular bleeding, dysmenorrhea 28.3%, 2.2% and 23.9% asymptomatic postmenopausal bleeding.[7,18]

The incidence of uterine myoma in women is estimated 20-25%, up to 70-80% in studies using the histopathological examination and ultrasonography. Ichimura et al., ovarian hormone believed to stimulate uterine growth due to an increased incidence after menarche and pregnancy is greater tumour growth but decreases after menopause. Farrer-Brown et al. showed that the most important cause of bleeding is the presence of endometrial ectasiavenules. Myoma is in the myometrium causing obstruction and proximal venous congestion in the myometrial and endometrial. Vein thrombosis and shedding were aetiology of bleeding in the endometrium.[17,26,27]

Brech et al., suggests a correlation between the severity of bleeding manifestations with a surface area of the endometrial. Along with a surface area of endometrial bleeding, the endometrium trigger local hyperestrogenism conditions in the area immediately adjacent to submucousmyoma, endometrial hyperplasia and endometrial polyps will often be found.[27]

Coagulopathy terminology used for systemic hemostatic abnormalities associated with PUA. According to Munro et al., 13% of women with menstrual bleeding has many systemic hemostatic disorders, and the most common is von Willebrand disease. Ovulatory dysfunction usually occurs in adolescent women, women with polycystic ovarian syndrome, hyperprolactinemia, hypothyroidism, obesity, weight loss, anorexia, excessive exercise or in perimenopause. Usually irregular bleeding, prolonged or shorter cycle with minimal bleeding.[7]

Counting the number of sanitary products is accurate method to measure blood loss during menstruation and also establishes the diagnosis HMB. Barr and Janssen et al., comparing the levels of haemoglobin women with menstrual blood loss, measured by the alkaline hematin method as the gold standard, obtained anaemia by 74%, while, hematocrit, serum iron and protoporphyrin that is inversely proportional to the amount of menstrual blood loss. Burnet et al., (2010) inaccuracies haemoglobin level with alkaline hematin technique, the accuracy rate is only 17% of the 166 research subjects. Chudnoff et al., (2010) menstrual pictogram examination and haemoglobin (alkaline hematin) are not accurate, because the low value of scoring bleeding on pictogram, causing false negative or false positive. In this study, 3 false negatives (3/23; 13.0%) and 1 false positive (1/23; 7.7%) of the 166 research subjects.[28-31]

This study is a clinical trial to determine the suitability pictogram and haemoglobin examination by measuring the amount of bleeding seen from the use of pads and given the least reference menstrual pictogram research in Indonesia. In this study, the *gold standard* could not be determined, because the examination of pictogram and haemoglobin has low sensitivity and specificity as well as compliance so it can't be used as gold standard.

There are no studies that determine the AUB by a decrease in haemoglobin levels with pictogram, this is the first study that tried to find the cut off point decreasing in haemoglobin levels and a pictogram to uphold the AUB diagnosis. However, this study proved that the haemoglobin or pictogram give a weak predictive value, so we need further research is good with more samples or other laboratory assessment criteria.

From ROC assessment, we obtained haemoglobin decline in predicting the AUB at 0.750% (good), although it can't be used because of no significance ($p = 0.054$). This is due to a decrease in haemoglobin is determined by the amount of bleeding in patients with AUB, while bleeding on the AUB depend on the AUB degree itself. There are no studies that examined the sensitivity and specificity of haemoglobin or pictogram. The importance of this study is as long as there is no clear limit to determine a diagnosis and determine AUB by haemoglobin decreased levels of haemoglobin by the pictogram. Nevertheless, the authors recognize that there are still many shortcomings in this study. The big difference in the results may be caused by several factors that can lead to bias in the form of the number of small samples, the accuracy of which is

used at the time of haemoglobin, the assessment of blood on the pads and form blood clots, intravenous fluids, diet, blood transfusion, as well as the body's response to bleeding/anemia. Future research may use a larger number of samples that include AUB broad patient population to provide valid results.

CONCLUSION

We found weak significance conformity between pictogram inspection with haemoglobin examination. Menstrual pictogram is not a suitable method for predicting a decrease in haemoglobin in an AUB patient population.

RECOMMENDATION

Further research is needed regarding the accuracy of the menstrual pictogram examination and haemoglobin by increasing the number of population and sample a larger scale and bias control.

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