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ปัจจัยเสี่ยงต่อการเกิดภาวะติดเชื้อแบคทีเรียในทางเดินปัสสาวะของสตรีมีครรภ์ที่ไม่มีอาการ

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Risk Factors for Asymptomatic Bacteriuria in Pregnant Women

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หลักการและเหตุผล: ปัจจุบันมีการแนะนำให้ใช้การเพาะเชื้อในปัสสาวะเป็นการคัดกรองภาวติดเชื้อแบคทีเรียในทางเดินปัสสาวะของสตรีมีครรภ์ที่ไม่มีอาการ (ABU) แต่การตรวจดังกล่าวไม่สามารถทำได้ทุกราย ดังนั้นการหากลุ่มเสี่ยงต่อภาวะนี้เพื่อเลือกส่งเพาะเชื้อในปัสสาวะจึงน่าจะเป็นทางเลือกที่ดี

วัตถุประสงค์: ศึกษาปัจจัยเสี่ยงของการเกิดภาวะติดเชื้อแบคทีเรียในทางเดินปัสสาวะของสตรีมีครรภ์ที่ไม่มีอาการ

รูปแบบการศึกษา: A cross-sectional study

สถานที่ทำการศึกษา: โรงพยาบาลศรีนครินทร์ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

กลุ่มตัวอย่าง: สตรีมีครรภ์ 774 ราย ที่มาฝากครรภ์ครั้งแรกที่ห้องฝากครรภ์ โรงพยาบาลศรีนครินทร์ มหาวิทยาลัยขอนแก่น

การวัดผล: ส่งปัสสาวะช่วงกลางสายของสตรีเหล่านี้เพื่อเพาะเชื้อ ทำการบันทึกข้อมูลเกี่ยวกับประชากรและสังคม ประวัติทางสูติศาสตร์ ประวัติเกี่ยวกับการติดเชื้อในทางเดินปัสสาวะ การตรวจครรภ์ และผลการเพาะเชื้อในปัสสาวะ วิเคราะห์หาปัจจัยเสี่ยงต่อการเกิดภาวะติดเชื้อแบคทีเรียในทางเดินปัสสาวะโดยไม่มีอาการ โดยใช้ univariate analysis และ multiple logistic regression analysis

ผลการวิจัย: ความชุกของภาวะติดเชื้อแบคทีเรียในทางเดินปัสสาวะของสตรีมีครรภ์ที่ไม่มีอาการเท่ากับ ร้อยละ 11.2 ปัจจัยเสี่ยงของภาวะ ABU ได้แก่ โลหิตจาง และระดับการศึกษาต่ำ โดยพบว่าสตรีมีครรภ์ที่มีโลหิตจางจะมีโอกาสเกิดภาวะติดเชื้อแบคทีเรียในทางเดินปัสสาวะโดยไม่มีอาการเป็น 2.5 เท่า ของสตรีมีครรภ์ที่ไม่มีโลหิตจาง สตรีมีครรภ์ที่มีระดับการศึกษาต่ำกว่าชั้นประถมปีที่ 6 จะมีโอกาสเกิดภาวะติดเชื้อแบคทีเรียในทางเดินปัสสาวะโดยไม่มีอาการเป็น 1.7 เท่า ของสตรีมีครรภ์ที่มีการศึกษาสูงกว่าส่วนอายุ อาชีพ รายได้ จำนวนการตั้งครรภ์ อายุครรภ์ ประวัติการติดเชื้อในทางเดินปัสสาวะ ไม่สัมพันธ์กับการเกิดภาวะ ABU

Background: Routine urine culture for all pregnant women is recommended as the screening test for asymptomatic bacteriuria (ABU). This is not readily available in many parts of the world including Thailand. Identification of the pregnant women at higher risk for ABU and performing urine culture to detect ABU may be the appropriate alternative management.

Objective: To assess risk factors for asymptomatic bacteriuria (ABU) in pregnant women.

Design: A cross-sectional study.

Setting: A tertiary care (university) hospital in Thailand.

Subjects: 774 pregnant women who attended their first antenatal care at Srinagarind hospital, Khon Kaen University were recruited for the study. Clean-catched mid stream urine were obtained from every subject for culture.

Main outcome measures: Information regarding sociodemographic characteristics, obstetric history, history of previous urinary tract infection, the status of the present pregnancy and the result of urine culture were recorded. Risk factors for ABU were initially evaluated by univariate analysis. We used multiple logistic regression analysis for controlling confounding effect.

Results: The prevalence of ABU in pregnant women was 11.2%. After univariate and multiple logistic regression analysis, anemia and low education were found to be significant risk factors for ABU in pregnant women. Anemic pregnant women had a 2.5 fold risk of having ABU compared with the non-anemic pregnant women. Low educated pregnant women had a 1.7 fold risk of ABU compared with educated subjects. Age, occupation, monthly income, gravidity, gestational age, previous history of urinary tract infection were not statistically

สรุป: การเลือกส่งตรวจเพาะเชื้อในปัสสาวะในสตรีมีครรภ์ที่มีโลหิตจาง หรือระดับการศึกษาต่ำอาจเป็นทางเลือกที่เหมาะสมในสถานที่ที่ไม่สามารถส่งตรวจเพาะเชื้อในปัสสาวะ ในผู้มาฝากครรภ์ทุกรายได้ หรืออาจทำการศึกษาหาวิธีตรวจคัดกรองที่มีความไวพอ และราคาไม่แพงมาใช้ในสตรีมีครรภ์ทุกราย

Conclusions: Selective urine culture for anemic or low educated pregnant women may be considered in situation in which routine urine culture for pregnant women is not feasible. A sensitive but inexpensive routine screening test is required to detect ABU in pregnant women.

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Introduction

Asymptomatic bacteriuria (ABU) is defined as the presence of > 10^5 colony forming units of single type of bacteria per millilitre of urine detected by midstream urine culture in asymptomatic patient[1-3]. The prevalence of ABU in pregnant women varied from 2.5 to 23.9%[4-7]. Without appropriate management 20% to 40% of pregnant women with ABU would have acute pyelonephritis later on during pregnancy[8-11]. This acute pyelonephritis is a risk factor for preterm delivery and low birth weight[8,12]. Accurate diagnosis of ABU in pregnant women and proper management is very crucial in preventing its serious consequences. Routine urine culture for all pregnant women is recommended as the standard management[1,11]. This is quite costly and not readily available in many parts of the world including Thailand. Simple urinalysis looking for the presence of white blood cells is not sensitive enough to be used as a screening test for ABU[4-6,13]. Identification of the pregnant women at higher risk for ABU such as age less than 20 years, primigravidarum, low socioeconomic status, anemia, previous urinary tract infection etc.[4-7,11,14] and performing urine culture to detect ABU may be the appropriate alternative management. We have conducted a cross-sectional analytical study to assess risk factors for ABU in pregnant women.

Subjects and methods

All pregnant women attending their first antenatal care at Srinagarind hospital, Khon Kaen University from June 1, 1994 to January 31, 1995 were eligible for the study. We excluded those subjects with symptomatic urinary tract infection and those who received any antibiotics during the past 7 days. There were 774 subjects recruited for the study. After explaining the objective of the study informed consent was obtained from every subject. Data regarding sociodemographic information, obstetric history and history of previous urinary tract infection and the status of the present pregnancy were collected. Routine standard antenatal care was given. Every subject who agreed to participate in the study received the detailed instruction on how to collect the clean-catched mid-stream urine sample into a sterile container. The women were instructed to clean the vulva with clean water before voiding. The urine sample were sent to the laboratory for urine culture within one hour after collection. Positive urine culture was defined as the presence of > 10^5 colony forming units of single type of bacteria per millilitre of urine[1-3]. If urine culture showed more than one type of bacteria it was defined as contamination. The clean-catched mid-stream urine sample was repeatly cultured within 2 weeks. Potential risk factors for ABU was initially determined by univariate analysis. All factors (age, occupation, income, education, gravidity, gestation, previous UTI and hemoglobin) were analysed by multiple logistic regression analysis to control for potential confounding factors. This study was approved by the ethical committee of the faculty of Medicine, Khon Kaen University.

Results

There were 774 subjects recruited for the study. The prevalence of ABU was 11.2%. There were 87 subjects with ABU and 687 without ABU available for the assessment of risk factors for ABU. **Table 1** shows the results of univariate analysis. Anemia which was defined as the hemoglobin level of less

Table 1: Association between various factors and ABU in 774 pregnant women by univariate analysis.

Factors	Culture results		p-value
	positive	negative	
Age (years)			
15 - 19	14	77	
20 - 34	68	583	0.2731
≥ 35	5	27	
Occupation			
• agriculture	30	245	
• trader	7	65	
• general employee	17	145	0.9221
• goverment service	7	82	
• housewife	26	150	
Income (Baht/month)			
< 2,500	8	85	
2,501 - 5,000	42	279	
5,001 - 7,500	13	102	0.7013
7,501 - 10,000	9	63	
10,001 - 12,500	6	53	
> 12,500	9	105	
Education			
≤ primary school	55	361	0.0772
≥ secondary school	32	326	
Gravidity			
1	46	308	
2	31	265	
3	7	85	0.2772
4	2	24	
5	1	5	
Gestation (weeks)			
<14	34	278	
15-28	31	237	0.9668
>29	22	172	
Previous UTI			
Yes	14	99	0.7969
NO	73	588	
Hemoglobin (g/dl)			
≤ 11	27	99	0.0001
≥ 11	60	588	

Table 2: Association between significant risk factors and ABU in 774 pregnant women by multiple logistic regression analysis.

Significant risk factors	Odds ratio	95% confident interval
Hemoglobin (g/dl)		
≥ 11*	1.00	
< 11	2.58	1.83, 4.88
Education		
≥ secondary school*	1.00	
≤ primary school	1.73	1.05, 2.98

* reference group

than 11 g/dl, was found to be significantly associated with ABU. Educational level was found to be borderline significantly associated with ABU (p=.07). Age, occupation, monthly income, gravidity, gestational age, previous history of urinary tract infection were not statistically associated with ABU. After multiple logistic regression analysis, anemia and educational level were found to be risk factors for ABU, **Table 2.** Anemic pregnant women have a 2.5 fold risk of having ABU compared with non-anemic. Pregnant women who completed only the primary school have a 1.7 fold risk of having ABU compared to those with higher education. The prevalence of ABU was 21.4% among anemic pregnant women and 13.2% among pregnant women who completed only the primary school.

Discussion

The prevalence of ABU among pregnant women in Srinagarind hospital, Khon Kaen university was 11.2%. This was about the average of the prevalence found in previous studies which varied from 2.3% to 17.5%[15-18]. Anemic and low education were found to be the only 2 significant determinants for ABU. This is in accordance with other studies[4,5,14]. Other risk factors for ABU demonstrated by other studies including age less than 20 years, primigravida, low income and previous history of urinary tract infection[6,7] are not confirmed by our study

Our study had a high power in identifying determinants for ABU. If the prevalence of the exposure of interest in the general pregnant women was 10%, our study had a power of 77% to detect their association with ABU given an error of .05 and odds ratio of 3[19]. The prevalence of all exposures that were assessed in this study were 10% or more. We also controlled the possible confounding effect by using appropriate statistical methods.

Since simple urinalysis is not sensitive enough in detecting ABU and routine urine culture is not readily available in many parts of the world including Thailand, selecting only the high risk subjects (which are those who are anemic and low educated) and performing urine culture in these subjects may be a more feasible and appropriate management for ABU. The other alternative is to identify and evaluate other screening tests such as urinary dipstick for urine nitrite, leukocyte esterase activity[20-21] etc. which are more practicable to be done routinely.

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