THE IMPACT OF OBSTETRICIAN/GYNECOLOGIST HOSPITALISTS ON MATERNAL QUALITY OF CARE IN YOGYAKARTA, INDONESIA: A COHORT STUDY

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ABSTRACT

Latar Belakang: Dokter rumah sakit (*hospitalist*) didefinisikan sebagai dokter yang selama 24 jam sehari / 7 hari seminggu membantu atau dipekerjakan oleh rumah sakit untuk mengelola pasien, triase, dan kegawatdaruratan. Model dokter rumah sakit dalam perawatan obstetri yang diperkenalkan dalam beberapa dekade terakhir memiliki peran penting dalam manajemen perawatan persalinan dengan potensi dampak positif pada luaran ibu. Sayangnya, data mengenai implementasi model dokter rumah sakit dan dampaknya terhadap kualitas perawatan ibu di Indonesia masih terbatas.

Tujuan: Untuk mengetahui dampak penerapan adanya dokter spesialis kandungan waktu penuh terhadap kualitas perawatan ibu

Metode: Desain penelitian ini menggunakan kohort retrospektif. Peserta yang disertakan adalah pasien sebelum dan sesudah implementasi peraturan dokter spesialis kandungan waktu penuh sejak Oktober 2013 hingga September 2014. Analisis univariat dan multivariabel dilakukan untuk mengevaluasi dan menentukan faktor yang secara signifikan mempengaruhi luaran ibu.

Hasil dan Pembahasan: Kami mengikutsertakan 71 pasien (30 di dalam kelompok dokter spesialis kandungan panggilan dan 41 dalam kelompok dokter spesialis kandungan waktu penuh). Analisis univariat mengindikasikan rata-rata waktu respon berbeda secara signifikan pada kelompok dokter spesialis kandungan waktu penuh ketika dibandingkan dengan kelompok dokter spesialis kandungan panggilan (65.3 ± 25.89 dibandingkan 84 ± 22.29 menit; p = 0.002). Implementasi dari dokter spesialis kandungan waktu penuh tidak berdampak pada penerimaan ICU dan insidensi transfusi.

Kesimpulan: Implementasi model dokter waktu penuh berhubungan dengan peningkatan yang waktu respon dalam penanganan kegawatdaruratan obstetri secara signifikan tanpa mempengaruhi luaran ibu.

Kata kunci: Angka kematian ibu, dokter spesialis kandungan, persalinan dan melahirkan, perawatan ibu, waktu respon ICU

ABSTRACT

Background: The hospitalist is defined by 24-hour a day/7 day a week physician who assists or is employed by the hospital to manage patients, triage and emergencies. The hospitalist model in obstetric care that was introduced over the last decades now has an important role in care delivery management with the potential positive impact on maternal outcomes. Unfortunately, in Indonesia there were limited data available related to the implementation of hospitalist model and the impact on maternal quality of care.

Objective: To determine the impact of obstetrician/gynecologist hospitalist on maternal quality care.

Method: This research design was a retrospective cohort. Participants included were the patients in the time before and after implementation of obstetrician/gynecologist hospitalist policy during October 2013

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until September 2014. Univariate and multivariate analysis were conducted to evaluate and determine the factors, which significantly contribute to maternal outcomes.
Result and Discussion: We included a total of 71 patients (30 in the on-call group and 41 in the full time hospitalist group). Univariate analysis indicated mean response time was significantly different in the hospitalist group compared to the on-call group (65.3 ± 25.89 vs 84 ± 22.29 mins; p = 0.002). Implementation of full-time hospitalists did not impact the ICU admission and transfusion incidence.
Conclusions: Implementation of the full-time hospitalist model was associated with a significant improvement of response time in emergency obstetric care without affecting maternal outcomes.

Keywords: Maternal mortality, obstetrician/gynecologist hospitalist, labor and delivery, maternal care, ICU response time

BACKGROUND

Indonesia, which recently had many significant achievements in societal, political, and economic development, still struggles with a high rate of maternal and infant death. Descriptive data from the 2012 Indonesia Demographic and Health Survey (IDHS) have shown that, maternal mortality ratio increased significantly from 228 per 100.000 live births in 2007 to 359 per 100.000 live births in 2012.[1,2] World Health Organization (WHO) estimated there were 8.800 mothers who died out of 4.5 million live births in 2013.[3] The direct obstetric causes are still considered the major reasons for all deaths. Obstetric complications such as hemorrhage, hypertensive disorders, and sepsis accounted for 80% and all other direct causes of death are about 20% .[4]

The conceptual framework developed by Thaddeus and Maine[5] identified the "three delays model" as significant contributors in maternal deaths, which are (1) delay in deciding to seek care, (2) delay in identifying and reaching a health facility and (3) delay in receiving adequate and appropriate treatment. Delay in receiving adequate treatment is still the main barrier in Indonesia, including limited availability of health staff and limited infrastructure or facilities.[6]

One of the problems faced by Dr. Sardjito General Hospital as a tertiary referral hospital for maternal care in the Yogyakarta Special Region is limited staff, which will create delay in preparation of surgery (i.e. Caesarean Section). The emerging model that was introduced over the past two decades is called "hospitalist medicine" or "hospitalist". Hospitalist as described by Wacther and Goldman has the following explanation. "The emerging role of 'Hospitalists' in the American Health Care System" is a physician whose primary focus is in the inpatient medical care.[7] Specifically, the obstetrician/gynecologist (ob/gyn) hospitalist is a 24-hour a day/7 day a week physician who assists or who is employed by the hospital to manage laboring patients, obstetric triage and emergencies.[8] Since April 2014, Dr. Sardjito General Hospital has already enforced the implementation of obstetrician/gynecologist hospitalists with the goal to shorten emergency response time for surgery.

The purpose of this study is to explore the impact of obstetrician/gynecologist hospitalists on maternal quality of care, and to compare emergency response time before and after the implementation of obstetrician/gynecologist hospitalists policy at Dr. Sardjito General Hospital in Yogyakarta, Indonesia.

MATERIALS AND METHODS

Study design, site and sampling methods

This retrospective cohort study was conducted in the Emergency Department of Dr. Sardjito General Hospital, Yogyakarta Special Region Province, Indonesia during the period of October 2013 until September 2014.

Seventy one pregrnant women who received crash emergency caesarean section were obtained from the population by purposive sampling technique.

The participant were pragnant women who received emergency caesarean section before and after implementation of obstetrician/ gynecologist hospitalist policy. Emergency caesarean section was defined as unscheduled caesarean deliveries by the surgeon.

Data Collection and Analysis

Information on demographic characteristics, gestational age, parity status, labor course and indication for caesarean section were collected. Emergency response time or decision-to-delivery interval, defined as the duration between the time decision was made to the time the baby was delivered by emergency caesarean section (in minutes) was recorded for each patient.

The primary outcomes measured in this study were maternal outcomes including requirement for transfusion and intensive care unit (ICU) admission.

Statistical analysis was performed using SPSS 16 (SPSS Inc., Chicago, Illinois, USA). Demographic and pregnancy characteristics in the 'before or on-call obstetrician' and 'after or full-time hospitalist' implementation of policy were compared. A normality test was conducted for continuous data with the Shapiro-Wilk test (*p > 0,05* indicated normal distribution) before each analysis. For normally distributed data, Student's *t-test* was performed to compare data between two groups ('on-call obstetrician' and 'full-time hospitalist'), and for non-normally distributed data the Mann-Whitney test was performed. Categorical variables were compared with bivariate analysis using the Chi-Square test. Multivariate analysis was performed to explore the factors that had significant association with emergency response time. Tests with $p < 0.05$ were considered statistically significant.

RESULTS AND DISCUSSION

Characteristics of study subjects

During the time periods described as six months before and after implementation of the policy (October 2013–March 2014 and April 2014–September 2014), data were reviewed on 30 cases and 41 cases respectively. Demographic and clinical variables are compared between the two groups in Table 1

Table 1. The mean response time before and after implementation of hospitalist policy

Variables	On-call Obstetrician (n=30)	Full-time Hospitalist (n=41)	P value
Mean response time, (mins)	84 ± 22.29	65.3 ± 25.89	0.002

Table 2. The characteristics of subjects grouped based on before and after implementation of hospitalist policy

Variables	On-call Obstetrician (n=30)	Full-time Hospitalist (n=41)	P value
Gestational age, n (%)			
< 37 weeks	8 (11.3)	21 (29.6)	0.03
≥ 37 weeks	22 (31.0)	20 (28.2)	
Parital status, n(%)			
< 3	25 (35.2)	28 (39.4)	0.15
> 3	5 (7.0)	13 (18.3)	
Birthweight, (grams)			
< 2500	14 (19.7)	23 (32.4)	0.43
≥ 2500	16 (22.5)	18 (25.4)	
APGAR Score			
< 7	18 (25.4)	27 (38.0)	0.61
≥ 7	12 (16.9)	14 (19.7)	

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The mean response time was significantly different in the full-time hospitalist group when compared to the on-call obstetrician group (p = 0.002). Neonatus in full-time hospitalist group were delivered significantly more preterm (p = 0.03) than in on-call obstetrician group.

Impact on maternal outcomes

Bivariate analysis was done to compare maternal outcomes between the two groups as shown in Table 2. Maternal outcomes measured in this study were ICU admission and incidence of transfusion. The result did not differ between both groups.

Table 3. Maternal outcomes between subjects group before and after implementation of policy

Variables	On-call Obstetrician (n=30)	Full-time Hospitalist (n=41)	RR (95% CI)	P value
ICU admission, n (%)				
Yes	1 (1.4)	2 (2.8)	0.67	0.61
No	29 (40.8)	39 (54.9)	(0.05-7.77)	
Transfusion, n (%)				
Yes	2 (2.8)	2 (2.8)	1.39	0.56
No	28 (39.4)	39 (54.9)	(0.18-10.49)	

Factors associated with maternal outcomes

Other factors were included in the analysis to measure the association with maternal outcomes such as parital status, gestational ages, readiness of operating theatre and anesthetist (Table 4).

Table 4. Multivariable analysis among variables that associated with maternal outcome: ICU admission

Variables	OR	CI (95%)	p value
Paritas > 3	0.18	0.15-2.25	0.18
Gestational age < 37 weeks	2.28	0.17-29.63	0.52
Readiness of anesthetist	0.27	0.31-8.56	0.71
Readiness of operating theatre	2.38	0.02-27,32	0.8

The implementation of full-time hospitalists in this study shows significant improvement of obstetric care delivery. This study assesses the impact of hospitalists on maternal a outcomes using specific parameters and patients. We found hospitalists could reduce response time significantly. Reduction in response time could improve clinical management and outcome. One previous study shows the decision to incision interval of more than 30 minutes is associated with higher incidence of adverse neonatal outcome, such as admission to the neonatal intensive care unit[9].

In our study results as shown in Table 1, the mean response time is significantly different in the full-time hospitalists group compared to the other group (65.3 $\pm$ 25.89 mins vs. 84 $\pm$ 22.29 mins; p = 0.002). Although the mean response time significantly improved, these results are still above the expected response time as recommended by RCOG/NICE guidelines. The National Institute for Health and Clinical Excellence (NICE) recommends delivery should be accomplished within 30 minutes where possible in cases of confirmed or suspected fetal compromised emergency.[10] Interestingly, Sibuea (2007) found that the incidence of severe asphyxia and neonatal mortality in emergency SC is higher than elective SC and vaginal delivery.[11]

In this study we also found, that neonates in full-time hospitalist group were delivered significantly more preterm (p = 0.03) than in on-call obstetrician group. The reason might have it was probably due to that most of the maternal referral to Dr. Sardjito General Hospital is medically indicated preterm birth in the period of implementation (April – September 2014). The other reasons is due to the status of Dr. Sardjito General Hospital which was a top tertiary referral hospital that could not reject all obstetric cases.

The results of our study show that maternal outcomes (i.e ICU admission and blood transfusion) did not significantly differ between the two groups. In a previous cross-sectional study the research was also unable to demonstrate the impact of the laborist staffing model on maternal composite morbidity such as maternal length of stay > 5 days, post partum hemorrhage, blood transfusion and uterine rupture.[12] A cohort study with samples of nearly 550.000 women from 24 hospitals (8 laborist and 16 non laborist hospitals) which evaluated the impact from implementation of laborist model also did not show a significant difference in chorioamnionitis incidences and maternal prolonged length of stay.[13]

A key concept of the OB/GYN hospitalist model is the 24-hour in-hospital coverage to improve maternal outcomes. Previous reports also show the same results with our study.[13] In contrast, Goffman and colleagues with a program similar to the laborist model showed a significant reduction (approx. 42%) in maternal and neonatal adverse events.[14]

CONCLUSIONS

Implementation of the full-time hospitalist model is associated with a significant improvement of response time in emergency obstetric care without affecting maternal outcomes.

LIST OF ABBREVIATIONS

OB/GYN: Obstetrician/Gynecologist
RCOG : Royal College of Obstetricians and Gynaecologists
NICE : National Institute for Health and Clinical Excellence
ICU : Intensive Care Unit
NICU : Neonatal Intensive Care Unit
IDHS : Indonesia Demographic and Health Survey
WHO : World Health Organization

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