Geographical distribution of hypertensive disorders in pregnancy and their adverse maternal and perinatal outcomes in Thailand

Abstract
Hypertensive disorders in pregnancy are a public health concern which has important adverse impacts on maternal and perinatal health, especially in developing countries. Among the hypertensive disorders in pregnancy, severe preeclampsia and eclampsia are contributed to the major causes of maternal and perinatal mortality and morbidity. Hypertensive disorders in pregnancy are found to be varied among different ethnicity and socio-economic status. This study aimed to assess the geographical distribution of hypertensive disorders in pregnancy across provinces of Thailand and the adverse maternal and perinatal outcomes. A secondary analysis of the hospital-based data retrieved from the 2014 database of the Thailand National Health Security Office (NHSO) using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD) for pregnancy, childbirth and postpartum conditions. All admitted pregnant women aged 10-49 years with ICD-10 for hypertensive disorders in pregnancy were analyzed. A total of 315,126 women delivered, the incidence of hypertensive disorders in pregnancy in Thailand was 27.5 per 1,000 deliveries. The incidence of severe preeclampsia/eclampsia in women aged ≥35 years was double or triple compared to those aged <20 or 20-34 years and more common in central, southern and eastern areas than in northern and northeastern areas. Among women with severe preeclampsia/eclampsia, 65.8% of them underwent cesarean section, 16.5% had preterm delivery and 3.4% presented postpartum hemorrhage. The findings of this study will guide the health personnel and policy makers to make the well-planned strategies for health system and services in accordance with the incidence of hypertensive disorders in pregnancy by geographical variation and their adverse maternal and perinatal health.

Keywords: hypertensive disorders in pregnancy, severe preeclampsia, eclampsia, adverse maternal and perinatal outcomes

Abbreviations: NHSO, national health security office; ICD, international statistical classification of diseases

Introduction
Hypertensive disorders in pregnancy is common global obstetric concerns which affect to the occurrence of adverse maternal and perinatal health, especially in all countries. Severe preeclampsia and eclampsia are the major causes of adverse maternal and perinatal mortality and morbidity worldwide including in Thailand. Since the etiology of hypertensive disorders in pregnancy is not well-known and unpredictable, the recognition of its geographic distribution is essential for the health personnel and policy makers in order to prioritize interventions, resource allocation for providing optimal health services to the high risk pregnant women. However, there were no the study using the national data for geographical distribution of hypertensive disorders in pregnancy in Thailand. In addition, the previous studies of the adverse maternal and perinatal outcomes in hypertensive disorders in pregnancy across provinces of Thailand and adverse maternal and perinatal outcomes in different subgroups of hypertensive disorders in pregnancy.

Methods
A secondary analysis of the hospital-based data retrieved from the 2014 database of the Thailand National Health Security Office (NHSO) using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD) for pregnancy, childbirth and postpartum conditions (O00-O99). All admitted pregnant women aged 10-49 years who delivered in the study period were analyzed. A secondary analysis of the hospital-based data retrieved from the 2014 database of the Thailand National Health Security Office (NHSO) using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD) for pregnancy, childbirth and postpartum conditions (O00-O99). All admitted pregnant women aged 10-49 years who delivered in the study period were analyzed.

The ICD-10 for hypertensive disorders in pregnancy using the code categories as O10, O11, O13, O14, O15 and O16 of which were classified into two groups:

a. Severe preeclampsia/eclampsia using O14.1 (severe preeclampsia), O14.2 (HELLP syndrome), O14.9 (preeclampsia, unspecified), O15.0 (eclampsia in pregnancy), O15.1 (eclampsia in labor), O15.2 (eclampsia in the puerperium), and O15.9 (eclampsia, unspecified as to time period).

b. Other types of hypertension using the rest of hypertensive disorders in pregnancy. Common maternal and perinatal outcomes measured included the postpartum hemorrhage, disseminated intravascular coagulation, renal failure, cesarean section, preterm delivery and stillbirth. The data were managed and analy-
The geographical distribution of hypertensive disorders in pregnancy across provinces of Thailand and adverse maternal and perinatal outcomes in different groups of hypertension were presented descriptively. This analysis was approved by the Institute Ethics Committee of Faculty of Medicine, Prince of Songkla University, Thailand.

Results

Of 315,126 women delivered, the incidence of hypertensive disorders in pregnancy in Thailand had a different geographic distribution. Pregnant women with advanced maternal age had an increased risk of the occurrence of severe preeclampsia/eclampsia. Common adverse maternal and perinatal outcomes were preterm delivery and postpartum hemorrhage. Early detection and prevention of adverse maternal and perinatal outcomes in women with hypertensive disorders are essential.

Discussion

The incidence of hypertensive disorders in pregnancy in our study (27.5 per 1,000 deliveries) was similar to the finding of secondary analysis of the World Health Organization Multicounty Survey on Maternal and Newborn Health from 29 countries in Africa, Asia, Latin America and the Middle East (27.3 per 1,000 deliveries) and showed various geographic distribution. A previous study conducted in central of Thailand reported the prevalence of preeclampsia accounted for 47 per 1,000 deliveries. The different reports on the incidence of hypertensive subgroups was mainly because the different classifications were chosen. Maternal age at ≥35 years were consistently reported to be the concurrent risk of hypertensive disorders in pregnancy. Maternal near-miss was increased among women with hypertensive disorders. Higher cesarean section was higher in China. Preterm birth and stillbirth increased in women with hypertensive disorders same as in a study in China, Africa and the United States. The findings of this study confirmed the importance of hypertensive disorders in pregnancy in which the policy action is required.

Conclusion

Hypertensive disorders in pregnancy in Thailand had a different geographic distribution. Pregnant women with advanced maternal age had an increased risk of the occurrence of severe preeclampsia/eclampsia. Common adverse maternal and perinatal outcomes were preterm delivery and postpartum hemorrhage. Early detection and prevention of adverse maternal and perinatal outcomes in women with hypertensive disorders are essential.

Acknowledgements

None.

Conflict of interest

Author declares that there is no conflict of interest.

Table 1 Age-specific incidence of severe preeclampsia/eclampsia across regions of the Thailand

<table>
<thead>
<tr>
<th>Regions</th>
<th>Age-specific incidence of severe preeclampsia/Eclampsia (Per 1000 deliveries)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>&lt;20 years</td>
</tr>
<tr>
<td>Central</td>
<td>10.4</td>
</tr>
<tr>
<td>Southern</td>
<td>8.6</td>
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<tr>
<td>Eastern</td>
<td>6.7</td>
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<tr>
<td>Northern</td>
<td>5.3</td>
</tr>
<tr>
<td>Northeastern</td>
<td>5.9</td>
</tr>
<tr>
<td>Total</td>
<td>7.5</td>
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References
