Brief report

Trends in deliveries in women with gestational diabetes in Spain, 2001–2008

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1. Introduction

Gestational diabetes mellitus (GDM) affects between 2 and 5% of pregnant women [1,2]. In recent years there has been a reported increased trend in the prevalence of GDM [1–3].

GDM is associated with increased risk of perinatal morbidity, maternal trauma, preeclampsia and eclampsia, and operative deliveries [4]. Epidemiological research suggests that women who have GDM have an increased risk of type 2 diabetes later in life [5]. While the studies referenced and others have found an increase in rate of pregnancy and newborn complications associated with GDM, few have analyzed the cost and the national burden associated with GDM [6].

The purpose of this study was to examine trends in the proportion of deliveries with GDM during the period of 2001–2008 in Spain. The characteristics and costs of delivery hospitalization among women with GDM are also analyzed and compared with women without GDM.

2. Methods

Hospital discharge data were obtained from the Spanish Minimum Basic Data Set [7].

We selected women 15–44 years of age with a delivery hospitalization defined by Diagnostic Related Groups (GRD) codes (370–375) listed anywhere on the discharge record.

We identified maternal hospital discharges for pregnancies complicated by GDM that resulted in the labour and delivery of an infant using ICD-9-CM code 648.8. We excluded discharge diagnoses with a code of pre-gestational diabetes mellitus (ICD-9-CM, 250.0x).
Table 1 – Demographic and hospital characteristics of delivery hospitalizations in women with gestational diabetes in Spain, 2001–2008 and comparison with women without GDM in year 2008.

<table>
<thead>
<tr>
<th>Year</th>
<th>Women with GDM</th>
<th>Women without GDM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. deliveries</td>
<td>Rate per 1,000 deliveries</td>
</tr>
<tr>
<td>2001</td>
<td>11,379</td>
<td>3.74</td>
</tr>
<tr>
<td>2002</td>
<td>11,587</td>
<td>3.72</td>
</tr>
<tr>
<td>2003</td>
<td>12,582</td>
<td>3.79</td>
</tr>
<tr>
<td>2004</td>
<td>13,695</td>
<td>3.96</td>
</tr>
<tr>
<td>2005</td>
<td>12,922</td>
<td>3.68</td>
</tr>
<tr>
<td>2006</td>
<td>12,342</td>
<td>3.40</td>
</tr>
<tr>
<td>2007</td>
<td>12,839</td>
<td>3.42</td>
</tr>
<tr>
<td>2008</td>
<td>14,297</td>
<td>3.58</td>
</tr>
<tr>
<td>2008</td>
<td>383,631</td>
<td>96,149</td>
</tr>
</tbody>
</table>


* Significant association (p < 0.05) for time trend among women with PGD (p < 0.05).
† Significant difference between women with and without PGD (p < 0.05).

Over the entire study period the Spanish College of Obstetricians and Gynecologists has been recommending the two-step process for diagnosis of GDM. This involves a 50-g glucose screening test for all pregnant women (weeks 24–28) followed by a 100-g 3-h oral glucose tolerance test (OGTT) to confirm the diagnosis in those with a positive screening result (>140 mg/dl; 7.8 mmol/l). Previous studies conducted in Spain suggest that the majority of obstetricians, working in both the public and private system, screen for GDM using this recommended method [8–10].

The outcomes of interest were mode of delivery (caesarean/vaginal), a composite variable of severe maternal morbidity (cardiac complications; complications of anesthesia; pulmonary embolism; bladder injury; postpartum haemorrhage), hospital length of stay (LOS) and costs of hospitalization.

Clinical covariates included medical illness (preeclampsia at delivery, a rate that was 2.8 times higher than in women without GDM, in 2008.

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In 2008, women with GDM were on average slightly older (32.9 vs. 30.2 years, p < 0.001) than women without GDM and the caesarean section rate and LOS by this mode of delivery were significantly higher.

Over 7% of women with GDM had a diagnosis of hypertension and/or preeclampsia at delivery, a rate that was 2.8 times significantly higher than in women without GDM, in 2008. Rates of caesarean section increased from 19% to 24.2% and length of stay after caesarean section decreased from 6 to 4 days over the study period. There was no significant trend over time for any of the obstetrical complications analyzed.

There were 101,643 deliveries coded for GDM among 2,782,369 delivery discharges resulting in an overall rate of 3.6/100 delivery discharges in Spain during the 8-year study period.

Rates, demographic characteristics, mode of deliveries, LOS, clinical complications and costs of delivery hospitalizations are presented in Table 1. The overall rate did not change significantly throughout the study period after controlling for age. The mean maternal age of deliveries in women with GDM (32 years) did not vary over time. When examining the change from 2001 to 2008 the greatest increases were observed in the older age group 35–44 years (34.6–39.7%).

Results

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4. Discussion

Our results provide us with the clinical profile of delivery hospitalizations among Spanish women with GDM. The rates of delivery hospital admission in women with GDM did not change significantly between 2001 and 2008. Other studies have reported increasing trends in GDM during their study timeframe which may be related to changes in screening recommendations or diagnostic criteria [6,11].

We found that the proportion of women who had a caesarean delivery increased but the prevalence of complications has not changed over the study period.

In the United States, Nicholson et al. reported a caesarean delivery rate of 34–37% among women with GDM [12]. In Spain, this rate (24.2% in 2008) is influenced by a variety of factors that include: an increase in demand feeding, previous caesarean section; and older maternal age of first pregnancy [13].

Our results indicate that there has been little progress to reduce the rate of maternal complications in women with GDM. Other study has documented similar findings [6]. Positive progress has been found in reducing the LOS after a caesarean section among these women.

The strength of this study is the large, validated population datasets that can provide useful insights into trends in prevalence and some key markers of obstetrical risk associated with GDM. Our study also has some limitations.

Compliance with screening for GDM will affect the rates of GDM. This has not been adequately measured in Spain although local studies conducted at specific hospitals suggest compliances of over 90% [14]. This study, like others [6,10,11], lacks data for medical management of pregnant diabetic women including pregnancy duration and timing of delivery. As with any administrative database there may be issues related to the validity and reliability of coding. We were able to control for age when comparing hospital characteristics and complications rates, but we were unable to control for other possible confounders such as maternal obesity, smoking habit and alcohol overuse [6,10].

In conclusion, we found no increase in the prevalence of GDM in Spain from 2001 to 2008. Rates of caesarean section increased and length of stay after caesarean section decreased from significantly over the study period.

Conflict of interest

There are no conflicts of interest.

References


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