Spontaneous preterm delivery in pregnant diabetics: A high risk hitherto “unrecognized”

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It is well known that preterm delivery is more frequent in the pregnant diabetic (using WHO’s definition of delivery before the 37th completed week, i.e. before the 259th day from the beginning of the last menstrual period). In most studies, data concerning the duration of the gestation either have been summarily reported or unreported completely. Moreover, the delivery occurring before the 37th week of pregnancy is sometimes defined as “preterm” only in cases of newborns infants weighing less than 2500 g. Thus, the risk of preterm delivery (PD) in pregnant diabetics has been underestimated. The risk of PD deserves close attention, considering that its incidence ranges from 50% to 80% or more (personal investigation in progress).

An even more serious consequence arises from the fact that cases of PD have not been classified into two groups: those due to labor with a spontaneous onset and those due to artificially induced delivery, i.e. stimulated labor and/or cesarean section. One is inclined to think that artificially induced delivery is by far the more common. In fact, in pregnant diabetics a policy of early delivery is generally followed considering the high risk of fetal death in the last month of pregnancy. In the last ten years considerable clinical research has been devoted to countering the expected adverse outcome of this policy, i.e. the risk of premature infants. This has required reliable tests of fetal well-being to be devised which enable the time of preterm delivery to be postponed. In contrast to what might be expected, the PD rate in pregnant diabetics due to spontaneous labor (spontaneous preterm delivery, SPD) is as frequent, if not more frequent, than that due to artificially induced delivery (induced preterm delivery, IPD). This has been recently pointed out by Mølsted-Pedersen in Copenhagen [5]. In cases of clinical diabetes in the Copenhagen series, SPD rate is 29% (a more accurate figure is obtained by subtracting the number of cases of IPD from the total: This brings the incidence of SPD up to 38%, 219/583; see Tab. I. When subdivided into White’s classes, the results are: B 21%, C 35%, D 26%, F 15%. The overall figure is thus six times the incidence of PD in general, which is about 5–8% [1, 5]. The percentage of IPD is lower, 22%; when subdivided into White’s classes this gives: B 15%, C 14%, D 20%, F 50%. The two groups together total 51%. This state of affairs has not changed with passing years: The figures show little change from 1959 to 1977, and the internal ratio did not change during the period (57/43), see Tab. I. Surprisingly enough, the SPD rate is also high in cases of gestational diabetes and, at 17% is three times higher than in the general obstetric population. From personal investigations, the data of other case studies at our disposal confirm to date the results of the Copenhagen series, with the largest differences noted in the incidence of IPD.

A different result emerges from our case study between 1963–1975. Insulin was administered to the maximal tolerated dose both in cases of gestational and clinical diabetes. Pregnancy was allowed to proceed until spontaneous labor which
Tab. I. Preterm delivery (< 259 days from the beginning of the last menstrual period)

<table>
<thead>
<tr>
<th>Author – years</th>
<th>Gestational diabetes</th>
<th>Clinical diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SPD</td>
<td>IPD</td>
</tr>
<tr>
<td>L. MØLSTED-PEDERSEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1959–1968</td>
<td>(19/92)</td>
<td>20%</td>
</tr>
<tr>
<td>1974–1977</td>
<td>(24/166)</td>
<td>15%</td>
</tr>
<tr>
<td>Total</td>
<td>(43/258)</td>
<td>17%</td>
</tr>
<tr>
<td>G. D. ROVERSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1963–1975</td>
<td>(19/265)</td>
<td>7.1%</td>
</tr>
<tr>
<td>M. CHARTIER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1962–1974 (Sept.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974 (Oct.)–1977</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPD = Spontaneous Preterm Delivery  IPD = Induced Preterm Delivery
> see the text

Internal ratio: \( \frac{\text{N}_\text{SPD} \times 100}{\text{N}_\text{SPD} + \text{N}_\text{IPD}} \)  \( \frac{\text{N}_\text{IDP} \times 100}{\text{N}_\text{SPD} + \text{N}_\text{IPD}} \)

sss: \( p < 0.001 \) (\( \chi^2 \) test)
was allowed by surveillance of fetal well-being [for details see reference 6, 7, 8, 9, 10, 11, 12]. The incidence of SPD is 6.7%: 7.1% in gestational diabetes and 6.1% in clinical diabetes (class B 4.5%, C 6.7%, D 4.8%, F 23.0%). Apart from class F, this means there is no difference from the PD rate in general. In only three cases (one of gestational diabetes, two of class F diabetes) was delivery artificially induced before term. This slightly increases the total to 7.5% in gestational and 7.2% in clinical diabetes (see Tab. I). M. CHARTIER in Paris has given us the results of what we believe to be a unique experience [2]. Between 1962 and 1974, he administered insulin according to what he defines as “classic criteria”, i.e. the guidelines generally followed in treating pregnant diabetics. In cases of clinical diabetes the SPD rate was similar to that of the Copenhagen series, 25%. In 1974 he began to adopt our therapeutic criteria. The SPD rate fell dramatically to 5.7%. As during the same period IPD had been reduced to 8.6%, the total PD rate dropped from 85% in the first period to 14.3% in the second (see Tab. I). These results are an obvious confirmation of our own experience.

This brief report puts forward the following considerations:

1. PD must be considered a first-class risk in pregnant diabetics. It occurs in 50—80% of the diabetic population. In diabetic patients neonatal morbidity is still high [3]. As the morbidity is to a great extent due to prematurity, its reduction closely depends on the substantial reduction of the above percentages.

2. Success will be somewhat incomplete if only prematurity due to artificially induced delivery is reduced. In fact, SPD occurs in about 30% of pregnant diabetics and accounts for half or more of PD in these patients. Therefore, the obstetrician should ascribe to SPD a risk that has hitherto been “unrecognized”, namely, the same concern which he has devoted so far to the risk of PD caused by prophylactic interruption of pregnancy.

3. We have already stated [6, 7, 8, 9, 10, 12] that since 1963 we have abandoned the policy of early delivery in pregnant diabetics without having to report a single case of fetal death in utero. At the same time, as is demonstrated in this communication, the risk of SPD gave us little concern, as its incidence was that generally accepted. This result is certainly attributable to the type of control of maternal diabetes we used, and the confirmation of CHARTIER’s series supports this view. How and why can insulin therapy bring about such a radical reduction in the risk of SPD in pregnant diabetics? Why in cases of slight metabolic derangement of the mother (gestational diabetes) is SPD rate three times higher than normal, as MØLSTED-PEDERSEN has shown? Our knowledge of the mechanism initiating term and preterm labor is too scarce to answer these questions [4]. Conversely, our knowledge of these mechanisms would be benefited if we could answer these queries.

Summary

Preterm delivery (PD) — before the 259th day from the beginning of the last menstrual period — is very frequent in pregnant diabetics (from 50% to 80% or more, personal investigation in progress). In these patients a policy is generally followed of a systematically controlled early delivery. Therefore, one is inclined to think that the high frequency of PD is mainly the consequence of this policy. However it has been recently pointed out [5] that spontaneous labor accounts for half or more of PD in pregnant diabetics. Moreover in pregnant women with gestational diabetes PD rate due to spontaneous labor is three times higher than in the general obstetric popula-

tion [5]. A different result emerges from our case study, 1963—1975. Insulin was administered to the maximal tolerated dose both in case of gestational and clinical diabetes [1, 6, 7, 8, 9, 10, 11, 12]. The incidence of PD due to spontaneous labor is 6.7% (7.1% in gestational and 6.1% in clinical diabetes), i.e. no difference from PD rate in general. Since 1974 M. CHARTIER, Paris, has been adopting the same therapeutic criteria [2]. His results seem to confirm that the risk of PD due to spontaneous labor drastically reduces in pregnant diabetics strictly controlled.

Keywords: Artificially induced delivery, diabetes in pregnancy, gestational diabetes, preterm delivery, spontaneous labor.

Zusammenfassung

Spontane Frühgeburten bei schwangeren Diabetikerinnen: ein bisher falsch interpretiertes Risiko.

Bei schwangeren Diabetikerinnen kommt es sehr häufig (nach eigenen Untersuchungen in 50–80% der Fälle oder mehr) zu spontanen Frühgeburten, d.h. zur Geburt vor dem 259. Tag p.m. In der Praxis geht man im allgemeinen so vor, daß man bei diesen Patientinnen den Geburstermin vorverlegt. Deshalb könnte man annehmen, die große Häufigkeit von Frühgeburten ist hauptsächlich Folge dieses Vorgehens. Vor kurzem ist aber gerade betont worden, daß es in mehr als der Hälfte der Fälle, wo es zu Frühgeburten kam, bei den schwangeren Diabetikerinnen spontane Wehen einsetzen [5]. Darüberhinaus treten bei Frauen mit einem Gestationsdiabetes spontane vorzeitige Wehen dreimal häufiger auf als in einem Normalkollektiv [5]. Unsere Untersuchungen aus dem Zeitraum von 1963 bis 1975 zeigen jedoch ein anderes Ergebnis: sowohl beim Gestationsdiabetes wie auch beim klinischen Diabetes haben wir Insulin bis zur maximal tolerierten Dosis verabreicht [1, 6, 7, 8, 9, 10, 11, 12]. Die Häufigkeit von Frühgeburten nach vorzeitigen Wehen betrug 6,7% (7,1% beim Schwangerschaftsdiabetes und 6,1% beim klinischen Diabetes), also kein Unterschied zur üblichen Frühgeburtenrate. Seit 1974 verfährt Dr. CHARTIER in Paris nach den gleichen therapeutischen Kriterien [2]. Seine Ergebnisse scheinen zu bestätigen, daß sich das Risiko von Frühgeburten wegen spontaner vorzeitiger Wehen bei strenger Überwachung der schwangeren Diabetikerinnen drastische reduzieren läßt.

Schlüsselwörter: Eingeleitete Geburt, Diabetes in der Schwangerschaft, Gestationsdiabetes, Frühgeburt, spontane Wehen.

Résumé

L'Accouchement prématuré spontané chez les diabétiques: Un haut risque jusqu'alors „masqué“. L'accouchement prématuré (AP) — avant le 259ème jour compté à partir du premier jour des dernières règles — est très fréquent chez la diabétique (50 à 80% ou plus, en augmentation selon les observations de l'auteur). En règle générale, chez ces patientes une politique de surveillance systématique est appliquée jusqu'au moment de l'accouchement. En conséquence, on est incité à penser que la grande fréquence d'AP provient principalement de cette attitude.

Toutefois, il a été récemment mis en évidence [5] que le déclenchement spontané du travail se produit chez la moitié ou plus des AP des diabétiques. En outre, chez les femmes enceintes présentant un diabète gestationnel le pourcentage d'AP secondaire à un déclenchement spontané du travail est trois fois plus élevé que dans la population générale des femmes enceintes [5]. Des résultats différents ressortent de l'étude de nos cas entre 1963 et 1975. L'insuline a été injectée à la dose maximale tolérée à la fois dans les cas de diabètes gestationnels et dans les cas de diabètes cliniques [1, 6, 7, 8, 9, 10, 11, 12]. L'incidence de l'AP secondaire au déclenchement spontané du travail est de 6,7% (7,1% pour les diabètes gestationnels et 6,1% pour les diabètes cliniques) c'est-à-dire sans différence avec la fréquence de l'AP dans la population générale. Depuis 1974, le Dr. CHARTIER, à Paris, a adopté les mêmes critères thérapeutiques [2]. Ses résultats semblent confirmer que le risque d'AP secondaire au déclenchement spontané du travail diminue considérablement au cours des grossesses des diabétiques rigoureusement contrôlées.

Mots-clés: Déclenchement de l'accouchement, diabète au cours de la grossesse, diabète gestationnel, accouchement spontané.

Bibliography


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