

# Fetal macrosomia and management of delivery

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## Summary

During the period 1988-1996, 737 pregnancies, in which the infant birth weight was  $\geq 4000$  grams were studied. During the same period there were 11,631 newborns, and 6.3% of them were infants with a birth weight  $\geq 4000$  grams.

Normal vaginal delivery occurred in 583 cases (79.1%), vacuum extraction in 24 cases (3.3%) and caesarean section in 130 cases (17.6%). Regarding the caesarean sections, 38 (29.2%) of them were elective and 92 (70.8%) were done in different periods of the labour.

In these macrosomic babies perinatal death never occurred, but different pathological neonatal outcomes were observed and the majority of these were clavicle abruptions (39 cases: 5.3%).

Maternal morbidity observed in the 607 (82.4%) cases with vaginal delivery is characterized by: 60 cases (9.8%) of vaginal and perineal tears, 4 cases (0.6%) of cervical tears, and 2 cases (0.3%) of pubic symphysis traumatic diastasis.

Shoulder dystocia is the most likely outcome in fetal macrosomic delivery; for this reason we considered the diagnostic and therapeutic management of this obstetrical complication.

Because the normal outcome of neonatal births actually encourages the preference for normal vaginal delivery, we concluded that mothers with macrosomic fetuses can safely be managed expectantly unless there is a high maternal and fetal risk.

**Key words:** Fetal macrosomia; Management of delivery; Neonatal outcomes.

## Introduction

Macrosomic babies are usually defined by a birth weight of  $\geq 4000$  grams. It is possible to define macrosomic fetuses as those with a birth weight above the 90<sup>th</sup> percentile of normal intrauterine growth, but these babies do not complicate delivery before the 37th week of pregnancy [1, 2].

Predisposition and maternal diabetes are the most likely causes [3].

Ultrasound fetal weight evaluation is at present the best diagnostic method for macrosomia, even with a 10% possibility of error [4].

The macrosomic fetus has a high risk of feto-pelvic dystocia, shoulder dystocia and brachial plexus damage. Antenatal diagnosis however brings about some problems regarding the type of delivery [5, 6, 7].

Elective caesarean section is the best delivery to prevent birth trauma, but it should be reserved for fetuses with a birth weight of  $\geq 4000$  grams for non-diabetic mothers and fetuses  $\geq 4250$  grams for diabetic mothers or if there are other than shoulder dystocia risk factors [8]. Many authors, in fact, have found evidence that shoulder dystocia risk does not increase as long as fetal weight is below these values [9].

However, there are no studies today which confirm the preceding affirmative. The elective induction of labour however, is likely to increase caesarean sections during labour without the advantage of preventing shoulder dystocia and other pathological outcomes [10]. In order to evaluate these considerations, we have studied fetal

neonatal and maternal outcomes in deliveries with a birth weight of  $\geq 4000$  grams born in the Obstetrics and Gynaecology Department of Verona University from 1988-1996.

## Methods

In our retrospective study on deliveries of macrosomic babies, we have considered 737 newborns with a weight of  $\geq 4000$  grams. Regarding risk factors, we have taken into account: maternal age, diabetic factors (including obesity and predisposition), recurrent fetal losses, fetal prematurity and macrosomic fetuses in other deliveries [11].

We paid attention to the last pregnancy, modality and maternal and fetal outcomes. We also included the mother's height, weight increase during the term and the pathological glucose levels throughout the pregnancy. We then examined labour, delivery modality and the reasons why the obstetrician chose operative delivery instead of normal vaginal delivery [12].

## Results

Seven-hundred and thirty-seven (6.3%), among all 11,631 newborns during 1988-1996 were macrosomic babies. Four-hundred and seventy-eight (64.9%) were male and 259 (35.1%) were female.

The mother's average age was 28 with an age range between 17 and 42 years. We diagnosed diabetes during pregnancy within the 36th week in 8 cases only (1.1%). It is true that the greater numbers of mothers, even with risk factors, did not have specific exams to diagnose diabetes during pregnancy. We made an early diagnosis of macrosomic fetus with ultrasound in 88 cases (11.9%) only, while for the other 649 cases (88.3%) this

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examination was not useful as it was done too early in the pregnancy.

We considered the mother's weight increase during pregnancy but we did not find a correlation between mother's weight increase and fetal weight increase. On the contrary, we found an important connection between the mother's weight before the pregnancy (body mass index which is kilograms/height<sup>2</sup> and the degree of fetal macrosomy. In fact, 60 (9.8%) among 609 mothers with normal BMI, gave birth to babies with a weight of  $\geq 4500$  grams, while 24 (18.9%) out of 128 mothers with a high BMI gave birth to fetuses with a weight of  $\geq 4500$  grams [13].

Delivery breakdown for the 737 macrosomic newborns: was 583 (79.1%) normal vaginal deliveries, while 154 (20.9%) were operative deliveries of which 24 (3.3%) were vacuum extraction and 130 (17.6%) caesarean section.

Of the 130 caesarean section cases, 38 (29.2%) were elective and 92 (70.8%) were emergencies during labour. Indications for vacuum extraction were 9 cases of uterine inertia, 9 cases of fetal distress and 6 cases of occipito-posterior presentation. Indications for caesarean elective section were 18 cases of macrosomic fetus, 8 cases of breech presentation, 5 cases of preeclampsia (EPH), 3 cases of uterine abnormality, 2 cases of abruptio placentae and 2 cases of cardiac disease in pregnancy.

Indications for urgent caesarean section during labour were 39 cases of pelvic dystocia, 28 cases of dystocia, 14 cases of fetal distress, 6 cases of breech presentation and 5 cases of abruptio placentae. When there was more than one indication together, we chose caesarean section due to the higher risk factor.

The early diagnosis of macrosomia with ultrasound in 18 cases only allowed the preference for operative elective delivery but 8 cases had other risk factors (like breech presentation, preeclampsia) while only 3 cases had as the first indication macrosomia risk (weight  $\geq 4000$  grams).

In our study we had no neonatal deaths among the 737 macrosomic newborns but we observed some pathological results: 39 cases (5.6%) had clavicle abruption, 5 cases (0.7%) caput succedaneum, 4 cases (0.5%) conjunctivitis haemorrhage, 4 cases (0.5%) cephalohaematoma, 4 cases (0.5%) face haematoma, 4 cases (0.5%) hip hypomotility, 3 cases (0.4%) birth brachial paralysis, 3 cases (0.4%) arm hypomotility, 2 cases (0.3%) jaw damage and 2 cases (0.3%) urinary system dilation.

It is important to consider that clavicle abruption, cephalohaematoma, caput succedaneum and obstetrical brachial plexus paralysis are intrinsic conditions in the macrosomic fetus vaginal delivery (normal or operative with vacuum extractor). To add that it was observed that there were 4 cases (0.5%) of cyanosis, spontaneously resolved, 3 cases (0.4%) of hypocalcaemia, 40 cases (5.5%) of jaundice and 9 cases (1.3%) of hypoglycaemia.

Finally, considering that the macrosomic fetus has a high risk of perinatal mortality and morbidity we had very good results. Above all if there is a high macrosomic degree fetopelvic disproportion.

The choice of delivery should also be made while considering maternal risk. Regarding this risk in our study,

we observed 583 (79.1%) cases of normal vaginal delivery against 154 (20.9%) cases of operative delivery (24 vacuum extraction; 130 caesarean section). If we consider the maternal pathological outcomes only in 607 (82.3%) cases with vaginal delivery, it is possible to observe these complications: 60 cases (9.8%) of vaginal and perineal tears, 4 cases (0.6%) of cervical tears, 2 cases (0.3%) of pubic symphysis traumatic dyastasis.

## Discussion

The outcomes of our 737 macrosomic newborns have been good in terms of mortality rate, with none having died. On the contrary, in terms of fetal and maternal morbidity, the conclusions have been less satisfying. The most frequent fetal pathology was clavicle abruption and less frequent but more serious was brachial plexus paralysis. Both of these conditions are bound together with shoulder dystocia which is a dangerous delivery complication for the macrosomic fetus, but it is rare if contrasted with the high percentage of macrosomia in the general obstetric population. This complication therefore explains only in part the choice for caesarean section for the macrosomic fetus with the risk of further increasing the already high number of operative deliveries in Europe [14]. We thought that if the fetus weight  $\geq 4000$  grams but is without other indicators (such as breech presentation, pelvic dystocia, maternal disease or fetal malformations), and the fetal weight is determined by ultrasound to not be too high, and thus causing fetopelvic disproportion, the obstetrician should choose normal vaginal delivery with spontaneous labour. In fact, elective induction of labour with prostaglandin and oxytocin or amniotomy has been in our experience an increasing factor for operative delivery and fetal risk.

In conclusion, the modality of delivery has been in the macrosomic fetus is very important and requires good diagnostic, preventative and epidemiologic knowledge, considering the increasing percentage of macrosomia in industrialised countries.

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