

Research of Obstetrics and Gynecology

((The effect of engagement on the outcome of labor))

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Abstract

This study was conducted on 100 pregnancy with engaged and non engaged fetal head presented at term in active labor. Any solid indication for cesarean section whether in the mother or the fetus was excluded. These cases were given a full trial of labor and the progress of each was recorded on a partogram. The mode of delivery, the duration of labor (first and second stage), the weight of the new born and the Apgar score were all recorded. Also maternal morbidity and mortality were recorded.

Epidural anesthesia was given to the patients on demand and the effect of it on the mode of delivery, the duration of the first and second stage and the Apgar score was reported.

After collecting the results from our data sheet and analyzing them we found that most of the patients included in the study delivered vaginally () and () only delivered by cesarean section. The pregnancies with unengaged fetal head at onset of labor, although at risk for C.S. most of them would deliver vaginally if they were given a full trial of labor and watched carefully.

INTRODUCTION

It has been the traditional concept in obstetrics that engagement occurs by 38 weeks in primigravida, and that engagement before the onset of labour will increase the chances of a safe vaginal delivery, and non engagement before the onset of labour will decrease the chances of a safe vaginal delivery.

This traditional concept is not correlated in clinical practice. In the majority the engagement occurs between 38-42 weeks or even during the first stage of labour. The incidence is very variable.

Hence controversy still exists over the significance of the fetal head level in early labour, whether it bears any relationship with mode of delivery.

Aim of Study:

The main aim of this research is to measure the correlation between engagement of pregnancy and the outcome of labour whether it's going to be a c/s or normal vaginal delivery and other factors that effect of the outcome of labour, these factors are:, age,height and weight , amount of liquor,period of labour, fetal condition ,lie and presentation

Methods:

Study Design: Analytic case-control study conducted in bint alhuda hospital \ThiQar \Iraq.

Study population: Data were obtained from the medical records in the bint alhuda hospital, a total of 100 cases of engaged and non engaged pregnancy were included in the study, these cases were matched by age , t, which obtained from pregnancy women attending Bint Al- Huda Teaching hospital.

Study period: From August 2018 to January 2019

Study variables: Different social and demographic and other specific factors were taken from the pregnancies , these factors are:. age,height and weight , amount of liquor,period of labour, fetal condition ,lie and presentation

REVIEW

ANATOMY OF THE PELVIS AND THE FETAL HEAD

The bony pelvis:

In both women and men, the pelvis forms the bony ring through which body weight is transmitted to the lower extremities, but in women it has a special form that adapts it to childbearing.

The pelvis is composed of four bones: the sacrum, coccyx, and two innominate bones. Each innominate bone is formed by the fusion of the ileum, ischium and pubis. The innominate bones are joined to the sacrum at the sacroiliac joint and to one another at the symphysis pubis. (Williams of obstetrics 22nd edition, 2005).

Pelvic anatomy:

The pelvis is divided into two parts: the false pelvis; of no obstetrical importance and the true pelvis; which is obstetrically important and the portion important in childbearing.

The false pelvis is bounded posteriorly by the lumbar vertebra and laterally by the iliac fossa. In front, the boundary is formed by the lower portion of the anterior abdominal wall. (Williams of Obstetrics 22nd edition, 2005).

The true pelvis is bounded above by the pelvic brim (inlet) which has the following boundaries: the promontory and alae of the sacrum, the linea terminalis (iliopectineal lines), and the upper border of the superior pubic ramus, pubic tubercle, upper border of the pubic bone (pubic crest) and the upper border of

the symphysis pubis. It is bounded below by the pelvic outlet. The outlet is bounded by bone and ligament including the tip of the sacrum, the sacrotuberous ligaments, the ischial tuberosities and the subpubic arch

(formed by the fused rami of ischial and pubic bones). (Clinical Obstetric and Gynecology, second edition, 2009).

The descending inferior rami of the pubic bones unite at an angle of 90 to 100 degrees to form a rounded arch under which the fetal head must pass. (Williams of Obstetrics 22nd edition, 2005). In the erect posture the pelvic brim is inclined at an angle of 65- 70° to the horizontal. Because of the curvature of the sacrum, the axis of the pelvis (the pathway of the descent of the fetal head in labor) is a J-shaped curve. (Clinical Obstetric and Gynecology, second edition, 2009).

The cavity of the true pelvis can be described as an obliquely truncated, bent cylinder with its greatest height posteriorly. Its anterior wall at the symphysis pubis measures about 5 cm and its posterior wall about 10 cm.

The walls of the true pelvis are partly bony and partly ligamentous. The posterior boundary is the anterior surface of the sacrum and the lateral limits are formed by the inner surface of the ischial bones and the sacrospinous notches and ligaments. In front, the true pelvis is bounded by the pubic bones, the

ascending superior rami of the ischial bones, and the obturator foramen.

The sidewalls of the true pelvis of an adult woman converge somewhat. Extending from the middle of each ischium are the ischial spines. These are of great obstetrical importance because the distance between them usually represents the shortest diameter of the pelvic cavity. They also serve as valuable landmarks in assessing the level to which the presenting part of the fetus has descended into the true pelvis. (Williams of Obstetrics 22nd edition, 2005).

PLANES AND DIAMETERS OF THE PELVIS

The pelvis is described as having four imaginary planes; the plane of the pelvic inlet, the plane of the pelvic outlet, the plane of the mid-pelvis-the least pelvic dimensions, the plane of greatest pelvic dimensions(of no obstetrical importance).

Pelvic inlet:

The pelvic inlet is bounded as follows, posterior by the promontory and alae of the sacrum laterally by the linea terminalis, anteriorly by the horizontal pubic rami and the symphysis pubis.

Four diameters of the pelvic inlet are usually described antero- posterior, transverse, and two obliques. The obstetrically important antero-posterior diameter is the shortest distance between the promontory of the sacrum and the most bulging point on the back of the symphysis pubis, and is designated the (obstetrical conjugate) .Normally, this measures 10.5 cm. The other non important anteroposterior diameters are the anatomical anteroposterior (true conjugate) which measures 11 cm. and the (diagonal conjugate) from the promontory to the lower border of the symphysis pubis and it measures 12.5 cm. The 2 transverse diameters are constructed at right angle to the obstetrical conjugate. The (anatomical transverse),

Fig (1): Pelvic inlet superior view.

Represents the greatest distance between the farthest points on the iliopectineal lines on either side. Normally, it measures 13.5 cm. It usually intersects the obstetrical conjugate at a point 4 cm in front of the promontory. The segment of the obstetrical conjugate from the intersection of these two lines to the promontory is designated the posterior sagittal diameter of the inlet. This diameter is not used by the fetus. The other transverse diameter (obstetrical transverse) bisects the true conjugate and is slightly shorter than the anatomical. It is of obstetric importance. Normally it measures 11-12 cm.

Each of the two oblique diameters extends from one of the sacro-iliac joint to the iliopectineal eminence on the opposite side. They average about 12 cm. The right oblique starts from the right sacro-iliac joint and vice versa. The right oblique is slightly longer than the left because:

-the left oblique diameter is shortened by the presence of the pelvic colon.

Williams Obstetrics, 23e 2009 > Chapter 2.

Maternal Anatomy > Musculoskeletal Pelvic Anatomy > Planes and Diameters of

the Pelvis > Pelvic Inlet.

-the left oblique diameter is anatomically slightly shorter.

There are 2 other oblique diameters (sacro-cotyliod) which extend from the promontory of the sacrum to the right and left iliopectineal eminence.

They measure 9-9.5 cm.

The obstetrical conjugate can not be measured directly with the examining fingers. For clinical purposes, it is estimated indirectly by subtracting 1.5 to 2 cm from the diagonal conjugate. The latter is determined by measuring the distance from the lower margin of the symphysis to the promontory of the sacrum.

Fig (2): antero-posterior diameters of the pelvic inlet and midpelvis.

Mid-pelvis:

The mid-pelvis is measured at the level of the ischial spines; the mid-plane, or the plane of the least pelvic dimensions. The interspinous diameter, 10 cm or some what more, is usually the smallest diameter of the pelvis.

(Caldwell WE, et al. 1934).

Williams Obstetrics, 23e 2009> Chapter 2. Maternal Anatomy > Musculoskeletal Pelvic Anatomy > Planes and Diameters of the Pelvis > Pelvic Inlet.

The antero-posterior diameter through the level of the ischial spines normally measures at least 11.5 cm. Its posterior component between the sacrum and the interspinous diameter is usually 4.5 cm. Clinical estimation of the midpelvic capacity by any direct form of measurement is not possible. If the ischial spines are quite prominent, the sidewalls are felt to converge, and the concavity of the sacrum is very shallow, then suspicion of a contraction is aroused.

Importance of the level of the ischial spines:

- It is the level of the levator ani, which is attached to the ischial spines.***
- The external os of the cervix and the vaginal vault lie at this level.***
- It is the level of the plane of the least pelvic dimensions.***
- The obstetric axis changes its direction at this level.***
- The head is considered engaged if the vault is felt at or below this level.***
- Forceps should not be applied when the head is above this level.***
- Anesthetic agent for pudendal nerve block is injected at this level.***

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Pelvic cavity:

Boundaries:

It is bounded above by the pelvic brim, below by the plane of the least pelvic dimensions, anteriorly by the symphysis pubis and posteriorly by the sacrum.

Planes of the mid pelvic cavity:

It is also known as "the plane of the greatest pelvic dimensions". It is widest part of the pelvic cavity.

It extends from the center of the back of the symphysis pubis to the junction between the 2nd and the 3rd pieces of the sacrum. It is round with all diameters equal 12.5 cm.

Internal rotation of the head occurs when the Biparietal diameter lies in this plane.

Pelvic outlet:

The pelvic outlet consists of two approximately triangular areas that are not in the same plane. They have a common base, which is a line drawn between the two ischial tuberosities. The apex of the posterior triangle is at the tip of the sacrum and the lateral boundaries are the sacro-sciatic ligaments and the ischial tuberosities.

The anterior triangle is formed by the area under the pubic arch.

Boundaries:

a. Anatomical outlet: bounded by;

Anteriorly: The lower border of the symphysis pubis. Posteriorly: The tip of the coccyx.

Laterally: The pubic arch, the ischial tuberosities and the sacrotuberous ligament.

b. Obstetric outlet:

It is a segment of the pelvis bounded by;

Above: The plane of the least pelvic dimensions. Below: The anatomical outlet

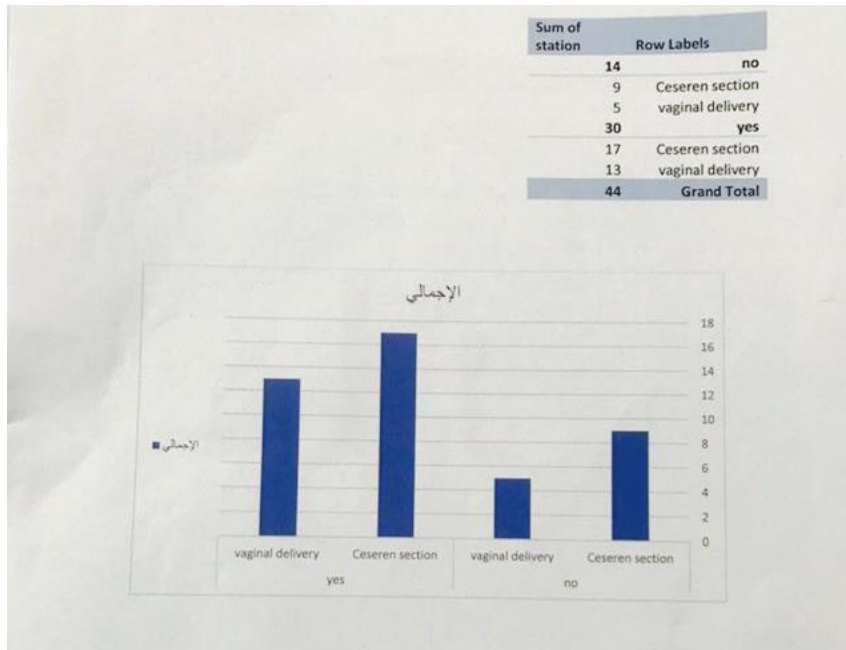
Posteriorly: The coccyx.

It should be noted that coccyx moves backwards in the 2nd stage of labor. So the lowest part of the posterior wall of the pelvic cavity becomes the tip of the sacrum and not the tip of the coccyx.

Name	
Age & blood group	
Height /weight	
Gestational age	
Amount of liquor	
Lie & presentation	
Labor duration	
Fetal condition pre labor	
Fetal HR during labor	
Station	
Cervical dilation	
Augmented or not	
Need forceps or not	
Need episiotomy or not	
Mood of delivery and why?	
Any complications	
Obst hx: Previous admission Aph Premature uterine contraction Leaking liquor HT,DM ROM or not Efficient Uterine contraction or not	
Result : Sex Weight Any congenital anomalies Jaundice ,anemia?	

:Result

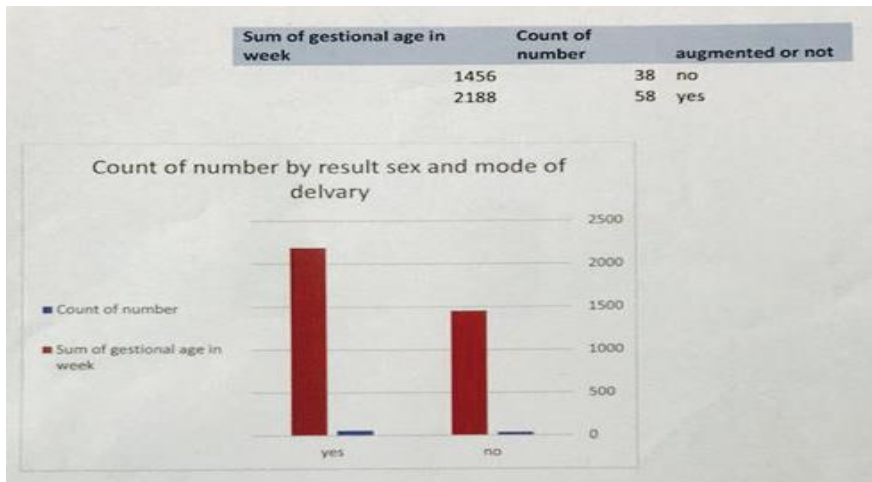
Diagram(1): relation between the no. Of pregnancies who are engaged/non engaged that went to c/s or vaginal delivery



This diagram shows the percentage of non engaged pregnancies who undergoes c/s are 9% while VD was 5% and the total of unengaged pregnancies are 14%

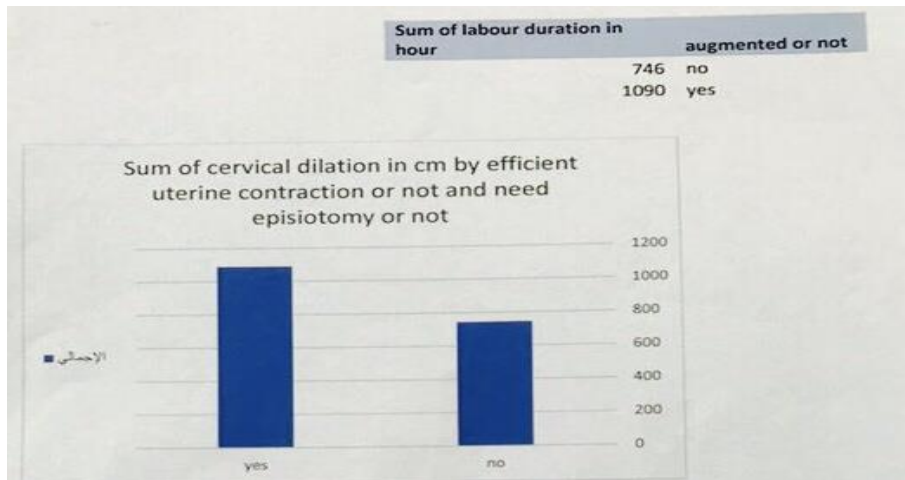
While engaged pregnancies percentage of who undergoes c/s was 17% And VD was 13% and the total of engaged pregnancies are 30%

Diagram (2): relation between the gestational age in week and Augmentation of Pregnancy



This diagram shows the count of no. Of gestational age in week 1456 who are not augmented in 38% of pregnancies. While 2188 of gestational age in week where augmented in 58% of pregnancies.

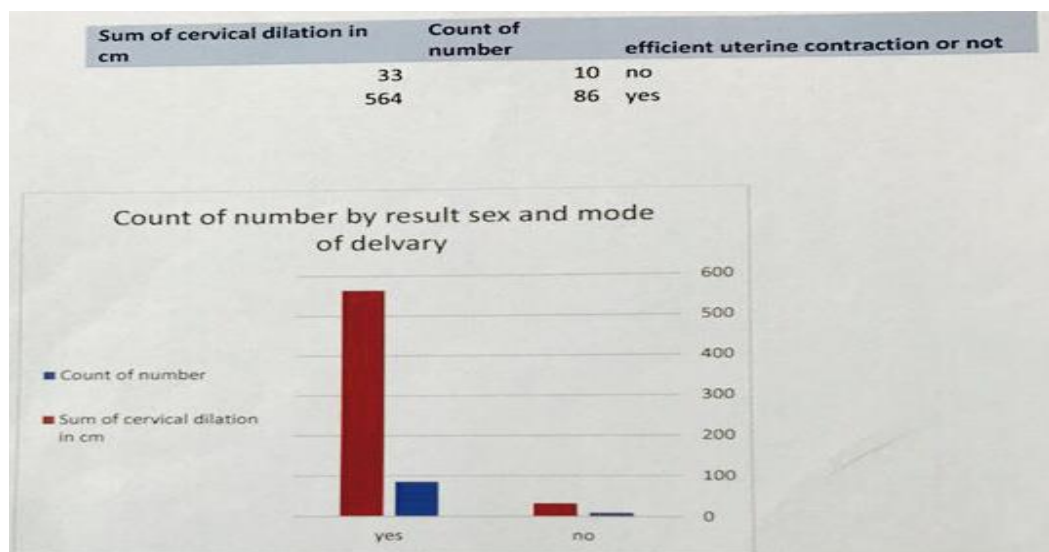
Diagram (3): the relation between labor duration in hrs and augmentation.



The sum of labor duration in hrs for non augmented pregnancies Was 746hrs

While the sum of labor duration in hrs for augmented pregnancies Was 1090hrs .

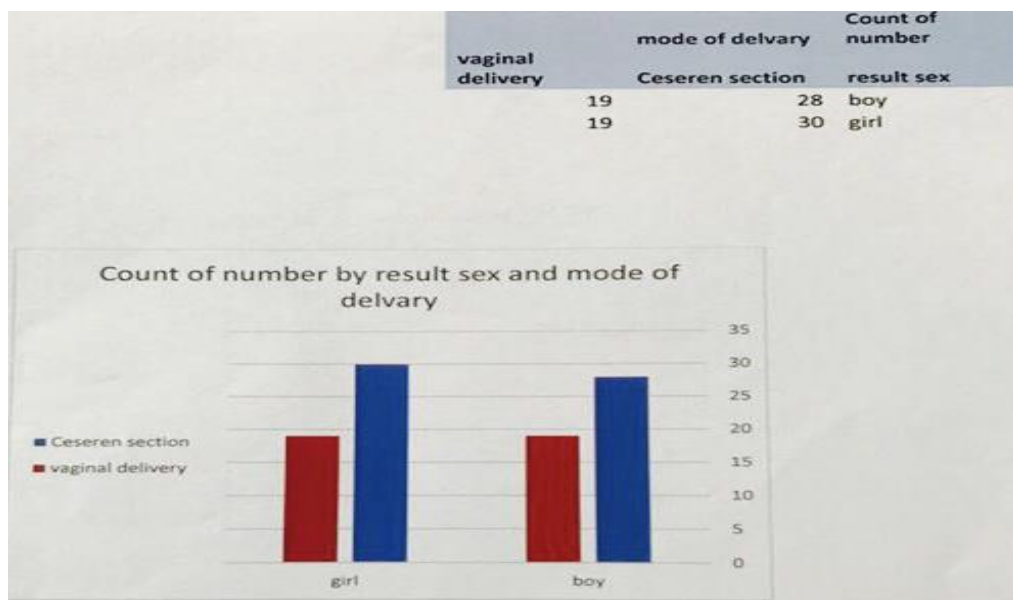
Diagram(4):shows sum of cervical dilation in cm and with efficiency Of uterine contraction .



The sum of cervical dilation is 564 cm as total in 86 pregnancy with efficient uterine contraction

While the sum of cervical dilation is 33cm as total in 10 pregnancies with No efficient uterine contraction.

Diagram(5):shows relation between sex and mode of delivery.



According to sex in a boy

The sum of c/s was 28 while VD 19

In a girl

The sum of c/s was 30 and VD 19

Discussion:

Nulliparas with un engaged head are at substantially higher risk of operative delivery and need to be identified as very high risk cases and should be referred for delivery to a health center where expert obstetrician and good operative facilities are available. This is especially important in a country like ours where (.) of patient deliver at home with out any antenatal care and therefore are at increased risk for obstructed labour with all its attendant morbidity and mortality.

In attempting to optimize patient management and identify women at risk of caesarean delivery, a few investigators have studied the impact of engagement of vertex at the time of active labour on the rate of caesarean . The present study was carried out to make an addition to the above mentioned efforts. The leading indication of primary caesarean delivery is dystocia. Station at time of arrest has been identified previously as a risk factor associated with increased rate of CS

Gabbe et al stated that engagement often occurs before the onset of true labour ,especially in nulliparas .Can engagement then be used as another clinical indicator for increased incidence of caesarean delivery in nulliparas.

The rate of Caesarean section was(9%) in woman with unengaged head versus (17%)in women with engaged head in our study.

Conclusion

Patients with unengaged head are higher risk for Caesarean delivery mostly due to for labour progress also has a higher mean birth weight of newborn .The incidence of active medical and surgical intervention in primigravidas with unengaged fetal head at term or onset of labour is quite high .Duration of labour is also increased in these women,if the attitude of watchful expectancy and timely intervention is used in these cases,by plotting apartogram and using oxytocin when labour appears to be taking protracted course.most of these will delivered vaginally with minimal maternal and fetal morbidity ,and thereby avoiding hasty decision toward caesarean delivery