

WEIGHT GAIN AND INCREASE IN FUNDAL HEIGHT AS INDICES OF FOETAL GROWTH IN NORMAL AND TOXAEMIC PREGNANCY

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Introduction

A practical method of assessing intra-uterine growth of the foetus has always been a problem confronting the obstetricians and paediatricians. Available methods are elaborate, expensive and time consuming and hence unsuitable for daily clinical use. Birth weight of an infant is an important criterion for judging the maturity and future health of the new born. The purpose of the present study was to establish a correlation between birth weight of a new born on the one hand and maternal weight gain and an increase in the height of fundus on the other hand at various stages of gestation in normal and toxæmic patients. An attempt has been made to see if there could be an easy clinical parameter of intra-uterine growth of foetus.

Material and Methods

A total of 115 patients attending antenatal clinic of AIIMS Hospital were studied from 20th week of gestation to delivery. Besides clinical history and thorough clinical examination, relevant laboratory investigations were carried

out. A special note was made regarding maternal weight gain and height of the uterus which was recorded with a caliper. Those recordings were made at the following periods of gestation; at 20, 24, 28, 30, 32, 34, 36 and 38, 39th weeks and at the time of delivery. Babies' weights were recorded at birth.

An attempt was made to draw a correlation between the maternal weight gain, rise in fundal height and the birth weight of the new born.

Observations

One hundred fifteen patients attending the antenatal clinic were studied. Out of them, in ninety-nine, pregnancy progressed normally and in sixteen patients pre-eclamptic toxæmia developed.

Correlation between maternal weight gain and babies' weight is shown in Fig. 1. It is found that birth weight of babies is directly proportional to gain in maternal weight in normal cases. A linear regression equation is fitted for baby's weight and gain in maternal weight as shown in Fig. 2.

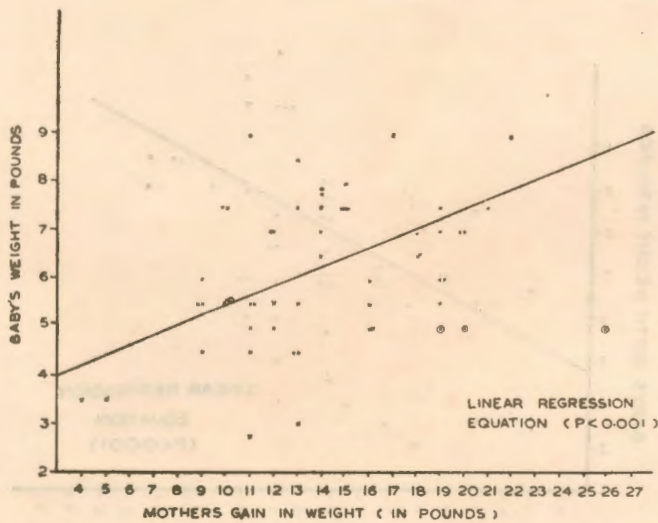
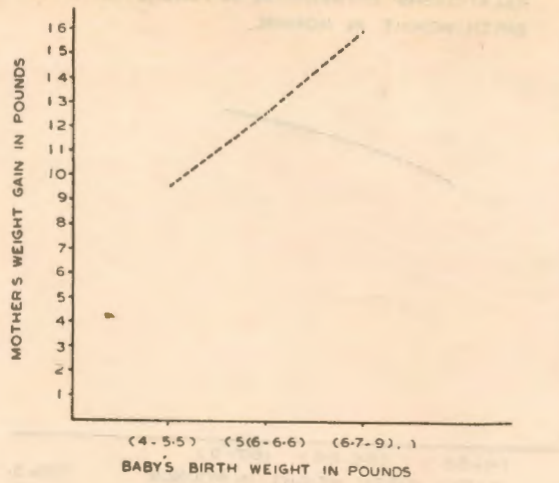
The regression equation of baby's weight and gain in mother's weight has been calculated as:

$$\text{Baby's weight in Kgms.} = 2.0086 + 0.1149 \text{ (Maternal weight gain in Kgms.) (where } 0.1149 \text{ is regression co-efficient)}$$

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MATERNAL WEIGHT GAIN AND BABY'S BIRTH WEIGHT IN NORMAL PREGNANCY.



When predicted weight is compared with actual birth weight, in 93% cases this equation is correct with a variation of ± 287.1 gms. and in the remaining 9% cases, variation is more than ± 312.9 gms.

Correlation between rise in fundal height and babies weight is shown in Fig. 3. It is found that birth weights of babies are directly proportional to rise

in fundal height. Again linear equation is fitted for baby's weight and rise in fundal height as shown in Fig. 4. This linear regression will be a straight line and equation called prediction equation. The regression equation of baby's weight and rise in fundal height has been calculated as:

$$\text{Baby's weight in Kgms.} = 1.6181 + 0.1101 (\text{rise in fundal height})$$

(where 0.1101 is regression co-efficient)

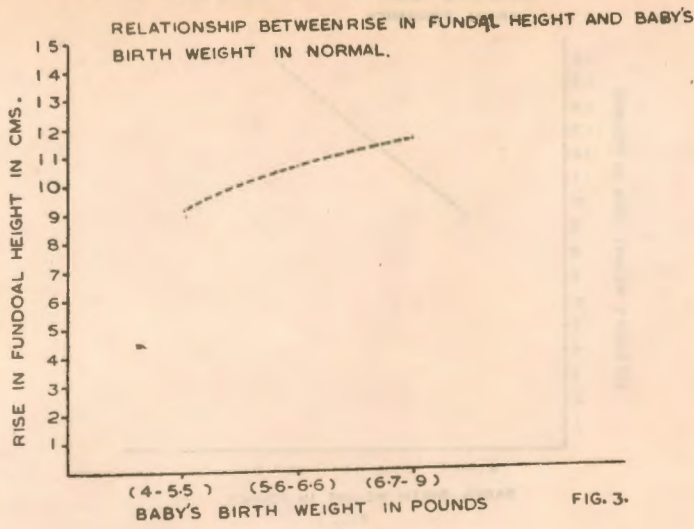


FIG. 3.

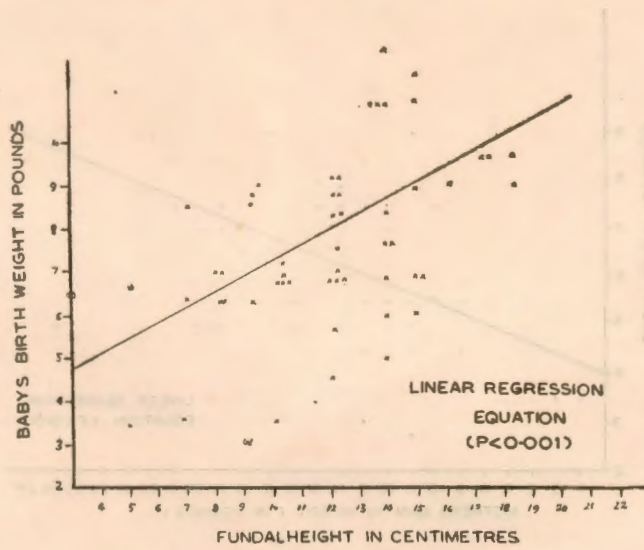


Fig. 4

Again when predicted weight is compared with the baby's actual birth weight, in 91% cases this equation is correct with a variation of ± 285.9 gms. and in the remaining 9% cases variation is more than ± 324.2 gms. Both these linear regression equations have given highly satisfactory fits to this data, as is indicated by 'F' test which is highly significant ($P < 0.001$ in

both the cases).

In cases of toxæmia, number of cases is not large to draw any definite conclusion, specially in case of rise in fundal height and baby's birth weight. Correlation between maternal weight gain and baby's birth weight in sixteen toxæmic cases is shown in Fig. 5. Here the pattern

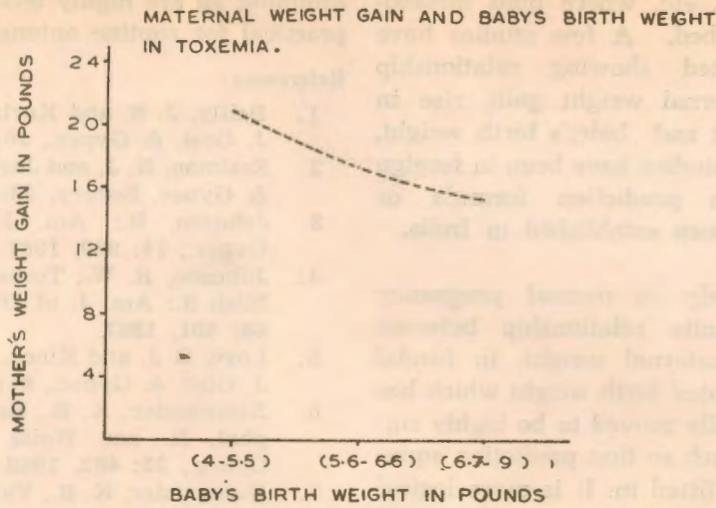


FIG. 5.

is just reverse of the normal. In spite of excessive gain in maternal weight, the birth weight tended to decrease.

Rise in fundal height in toxæmic patients and its relationship to baby's birth weights is shown in Fig. 6. From this

Discussion

Accurate estimation of foetal weight continues to be a major consideration to obstetricians. This need is most pressing when elective induction of labour or repeat caesarean section is contemplated.

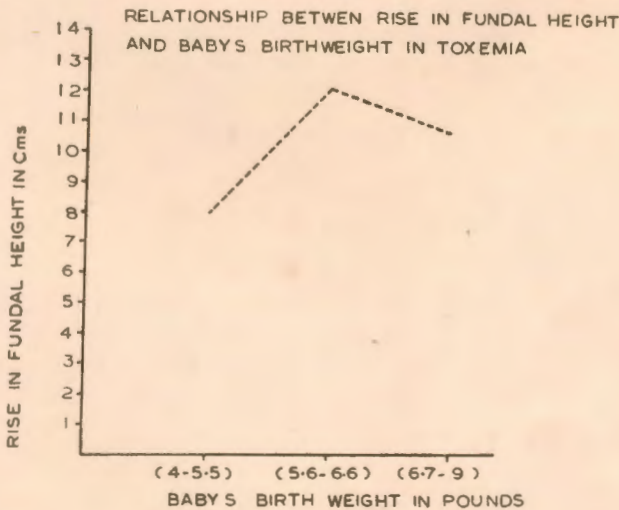


FIG. 6.

graph no definite conclusion can be drawn except that administration of diuretics for management of toxæmia may have altered the picture.

Foetus, placenta and amniotic fluid contribute to 1/3rd of maternal weight gain. Hence, maternal weight gain reflects on foetal growth, except in complicated cases

like toxæmia, etc. where fluid metabolism is disturbed. A few studies have been conducted showing relationship between maternal weight gain, rise in fundal height and baby's birth weight, and all these studies have been in foreign countries. No prediction formula or norms have been established in India.

Present study in normal pregnancy shows a definite relationship between increase in maternal weight, in fundal height and babies' birth weight which has been statistically proved to be highly significant, so much so that prediction equation could be fitted in. It is more logical that carefully made measurements could correlate with foetal weight better than a mere clinical palpation without objective measurements. Ultrasonics, radiological measurements and amniotic fluid

sampling all are highly technical and not practical for routine antenatal care.

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