FEMALE PELVIC ARCHITECTURE AND ITS CORRELATION WITH THE NATURE OF LABOUR

BY

T. K. GHOSH, B.Sc., M.B. (Cal.), M.R.C.P. (Edin.), D.G.O., L.M. (Dub.);

SUBODH MITRA, M.B. (Cal.), Dr. Med. (Berlin), F.R.C.S. (Edin.), F.R.C.O.G., F.A.C.S.;

S. K. BASU, M.Sc., M.B., D.T.M., D.P.H., Ph.D. (Edin.).

Calcutta.

Cephalopelvic disparity is one of the most difficult problems in obstetrics, specially when it is concerned with the borderline group. Until recently clinical methods of finding out disproportion were the only means of detecting it. It is not always possible to predict the nature of confinement although an accurate and precise knowledge of the pelvic architecture to a certain extent facilitates our prediction. Thoms maintains that the most careful external measurements are unreliable. According to Rohan Williams the possible disproportion between the head and the pelvis is one of the most difficult things to determine in obstetrics, and he has observed that the clinical measurement of the true conjugate is either impossible or inaccurate unless there is gross pelvic contraction. They indicate that by proper X'ray pelvimetry, accurate determinations of different pelvic dimensions can be measured and the capacity of the pelvis can be determined. According to Stander, there is a "reduction in foetal mortality from 3.2 percent to 2.2 per cent partly due to the integration between the clinical and X'ray pelvimetry."

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In this investigation, we have taken up only nulliparous and primigravid cases for our study by X'ray pelvimetry. We have not taken any multiparous cases in this series. We apprehend that standard diameters of the pelvis may be altered by the stress and strain of labour in multiparous cases.

We have endeavoured to place before the Congress the average types of pelves in Bengali women, the study of different diameters of the inlet by X'ray examination and their relations to labour. For this purpose we have used Thoms' modifications of the simple and useful classification of pelvis suggested by William Turner in 1885. This is based on the relationship of the anteroposterior and the transverse diameters of the inlet. Thoms suggests four types of pelvis instead of three as given by William Turner.

These are:—

(1) Dolichopellic type: The anteroposterior diameter of the inlet is longer than the transverse diameter.

(2) Mesatipellic type: The anteroposterior and transverse

diameters are equal or transverse diameter is not more than 1 cm. longer than the anteroposterior.

(3) Brachypellic type: The transverse diameter is more than 1 cm. longer than the anteroposterior diameter.

(4) Platypellic type: The transverse diameter is 3 cm. more than anteroposterior diameter.

Material:

One hundred and forty cases were examined in two series. The first series consists of 78 cases of nulliparae and primigravidae and the second series consists of 62 cases of primigravidae at or near term. The material was drawn mostly from R. G. Kar Medical College, Chittaranjan Seva Sadan as well as from private cases.

Methods:

The technique used here was that of Thoms.

Three skiagrams were taken for each subject, though in this study we have reviewed only the two, for the inlet, viz. (a) superoinferior and (b) lateral.

For the superoinferior skiagram, the subject was laid against an adjustable back rest kept on the X'ray table in such a way that the plane of inlet lay horizontal. The height of the plane of inlet then was noted down and later inscribed in each film. In the first series, Thoms' grid was used. In the second series, a calculated scale was kept against the film inside the cassette, so that when the film was exposed, the shadow of the pelvis as well as the scale was seen on it. The film target distance was always kept constant at 90 cm. (36 inches).

The lateral skiagram was taken with the subject in erect posture against the vertically placed table in such a way that the femora lay in one line between the tube and the film. A vertical leaden scale, notched at 1 cm. distance was placed against the gluteal fold of the subject.

The difficulties in carrying out this work were firstly, the diffidence of subjects to come forwards for such investigation in this country, secondly, most of the patients came to hospital with labour pains, so that the taking of a skiagram was not always possible, thirdly, the difficulty of following up labour of patients taken from the antenatal clinic, for they were not always confined in the same hospital, nor did they report about their confinements and lastly, the expensiveness of this type of investigation.

Uptil now we have been teaching our students about the importance of external pelvimetry and its relation to the inlet diameters.

External pelvimetry does no doubt give us some idea of the gross pelvic abnormalities but any precise knowledge of the diameters of the inlet cannot be vouchsafed. Deductions drawn from external pelvimetry are not only fallacious but often misleading.

We have analysed 111 pelves and have found that the time-honoured teaching, that the true conjugate is 7 to 7.5 cm. less than the external conjugate and the transverse diameter is half of the intercristal

diameter, cannot be substantiated by X'ray pelvimetry. In another 29 cases the external measurements were either not taken or are missing, and so they have been excluded from this study.

There may be personal errors in the measurement of the three external diameters but the difference is so much that this cannot be compensated, as will be seen from Table I and II and Figs. 1 and 2.

the general belief that the anteroposterior diameter is 7 to 7.5 c.m. less than the external conjugate diameter. Even if we extend this figure of difference, as in Table I, from 6.6 cm. to 8 cm., still it comes upto 45.9 percent i.e. it is less than even 50 percent correct of the conventional figure.

Table II and Fig. 2 show that only 5.4 per cent of the total cases have the

TABLE I

Total: 111 cases.

Difference in cm. between External Conjugate and Anteroposterior Diameter of the inlet

Difference in cm.	3.1 to 6	6.1 to 6.5	6.6 to 7	7.1 to 7.5	7.6 to 8	8.1 to 9	9.1 to 12
Number of Cases	25	13	14	23	14	16	6
Per cent.	22.5	11.7	12.6	20.7	12.6	14.4	5.4

TABLE II

Relation between Transverse Diameter of the inlet and Inter-Cristal Diameter.

The figure shows in cm. the amount-excess or less of the double figure.

	Double	Excess of less of the double (in cm.)					
		1 to 1 cm.	1.1 to 1.5 cm.	1.6 to 2 cm.	2.1 to 3 cm.	3.1 to 4 cm.	4.1 to 6 cm.
Actual	6	14	10	16	27	26	12
Per cent.	5.4	12.6	9	14.4	24.3	23.45	10.8

Table I and Fig. 1 show the difference of the external conjugate and the true conjugate. Only 20.7 percent of cases showed a difference of 7.1 to 7.5 cm. between the two, which is a remarkably low figure. This proves anything but the contrary of intercristal diameter exactly double of the transverse diameter. Even if we extend this figure to 2 cm. (i.e. 2 cm. more or less than the double figure of transverse diameter) still we see that only 41.4 percent of cases show any relationship.

TABLE III

Distribution of Pelvic type in Bengali Women

Type	No.	Percent
Dolichopellic	36	25.7
Mesatipellic	69	49.3
Brachypellic	32	23.0
Platypellic	3	2.0

Table III shows the distribution of different types of pelves as found in our series. Majority of the pelves will be found to be mesatipellic in type. Next in order comes the dolichopellic type. If these are compared with the figures given by Thoms in his two series (Table IV) it will be seen that there is no significant difference in the results. In both the series it will be seen that transversely oval pelvis (brachypellic or platypellic) is not the dominant type, this being 25 per cent in our series and 30.8 percent and 28 per cent respectively in Thoms' series of 500 white women and 100 negro women. Gruelich and Thoms have shown that the pelvis at puberty is predominantly dolichopellic in type. They have also shown that soon after menarche the superior strait grows almost to the adult proportion.

It is maintained that probably nutrition to some extent is responsible for pelvic architecture and well nourished females are more prone to

TABLE IV

Thoms' series—Distribution of pelvic type.

Type	White women		Negro women	
	No.	Per cent	No.	Per cent
Dolichopellic	113	22.6	29	29.0
Mesatipellic	233	46.6	43	43.0
Brachypellic	144	28.8	25	25.0
Platypellic	10	2.0	3	3.0

TABLE V

The clinical course of the second series of 62 cases was reviewed according to pelvic type and summarised.

Type	Low Forceps	Operative results	
Dolichopellic	Nil	Nil	
Mesatipellic	3	3	All caesarean section, of which 2 were of small pelvis and 1 for cervical dystocia.
Brachypellic	3	1	Caesarean section for cephalo-pelvic disproportion.
Platypellic ..	Nil	Nil	

get the dolichopellic type of pelvis. But our study was made mainly from group of subjects who were of poorer class and whose diet was very much below the normal average of a well-to-do person. Even so, the predominance of dolichopellic type of pelvis is remarkable.

The clinical course of the second series of 62 cases was reviewed according to the pelvic type and is summarised in Table V. Here we find that the maximum number of operative interference was in brachypellic type. There was no interference in the platypellic type in our series. No conclusion can be drawn because the number is too small though the diameters correspond to big platypellic type .

	Per centage of operative intervention
Dolichopellic ..	0.0
Mesatipellic ..	7.4
Brachypellic ..	5.0
Platypellic ..	0.0

TABLE VII

Mean value of different diameters in different types of pelvis in cm.

Types	A.P.	T.D.
Dolichopellic ..	11.56	11.18
Mesatipellic ..	10.78	11.3
Brachypellic ..	10.34	11.83
Platypellic ..	8.97	12.08

Lastly Table VII gives the mean value of different diameters in different types.

Further work on this line is essential to find out standard diameters of the different types of pelves in Bengali women. Similar type of work should be taken up in other provinces to find out the standards in women in different races in different provinces of India. We are definitely of opinion that as India is a vast sub-continent, we shall find significant variations in different types of pelvis amongst women of different provinces of India. This will be an interesting as well as important study not only to find out correlation between labour and pelvic architecture but also to set up our standard diameters of pelvis of different groups of Indian women for our medical students.

TABLE VI

The maximum and minimum diameters of the inlet of the different types in cm.

Diameters.		Dolicho-pellic	Mesati-pellic	Brachy-pellic	Platy-pellic
Anteroposterior:	Max.	12.88	12.88	11.35	10.0
	Min.	9.17	9.35	9.15	9.6
Transverse :	Max.	12.2	13.54	12.12	13.0
	Min.	9.4	9.2	10.44	12.6

Table VI shows the maximum and minimum measurements of both the transverse and the anteroposterior diameters of the different types.

Summary

1. One hundred and forty pelves were examined by X'ray pelvimetry to study the types of pelves in Bengali women.
2. Of these, one hundred eleven cases were also studied to find any relationship between external and X'ray pelvimetry of the inlet diameters and were found to be very inconclusive and fortuitous.
3. A review of clinical course of labour has been given in the 62 cases of primigravida. Obstetric interference were encountered in mesatipellic and brachypellic types.
4. The maximum and minimum diameters along with the average mean values of the different types have been given.
5. Dominant types are found to be dolichopellic type and mesatipellic type. This stands comparable to the findings of Thoms and various other American workers.

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