ANOMALOUS UTERINE DEVELOPMENT AND PRIMARY INFERTILITY

by

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This study of hysterosalpingographic (HSG) evaluation was primarily undertaken as an integral part of the basic infertility workup. All women reporting for infertility workup, including those preferring AID (Rajan *et al*, 1978), were investigated for tubal function by HSG. At that time, a group of patients in whom there was no obvious cause for infertility was observed to have a disproportionately large number of subtle types of uterine anomalies. Interested in this observation, we undertook to study whether the uterine configuration is related to infertility. In this presentation we have attempted to relate uterine malformations to primary infertility by comparing the frequency of such anomalies in those who have no proved cause for sterility against those having a definite cause for infrtility and those who became pregnant following the investigations.

We have classified uterine abnormalities, into hypoplastic, subseptate, mild subseptate, very mild subseptate, planifundus, bicornuate and unicornuate, as proposed by Jarcho in 1946, and modified by Hay (1958 and 1961). Fig. 1 through 7 illustrate hysterographic examples of different types of uterine contours.

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Meterial and Methods

Hysterograms of 313 consecutive women, investigated for infertility problems were analysed for abnormal uterine contours. The study was conducted under the following subgroups:

(i) *Female Infertility Factors*: Among them 81 patients had proved female infertility problems such as tubal dysfunction or anovulation.

(ii) *Male Infertility Factors*: Another 81 women investigated had obvious male factors such as severe oligospermia or azoospermia.

(iii) *No Apparent Cause for Infertility*: A good proportion of women, viz., 97 had a normal male factor, patent fallopian tubes, and normal ovulatory cycles; and obviously there was no cause for the primary infertility.

(iv) *Pregnancy Following Investigation*: Fifty-four women, who had neither a male nor a female factor compromising fertility, conceived within few months of the investigation without any form of treatment.

HSG was performed with water soluble contrast media such as Diaginol viscous, Verografine and Conray-420. Leech-wilkinson type of cannula was used, which was placed half way into the cervical

canal. After an initial injection of 3 to 5 ml of dye one anteroposterior film was taken. This view provided maximum visualisation of the uterine cavity and to some extent the fallopian tubes. Smaller quantity of dye also provided for minimal distortion resulting from overfilling of the uterus. Subsequent exposures taken after injection of some more dye were employed for evaluation of the tubal function. There were no complications attributable to the technique or to the dye.

Observations

Of the 313 consecutive women investigated, the hysterographic configuration was demonstrably abnormal in 161 women (51.40 per cent). Indeed, the majority were minor degrees of abnormalities such as subseptate, mild subseptate and very mild subseptate varieties (Table I).

TABLE I

Uterine Malformations in the Total Infertile Women

Type of malformation	No.	%
Subseptate	32	10.20
Mild subseptate	54	17.30
Very mild subseptate	34	10.90
Planifundus	14	4.50
Bicornuate	9	2.90
Unicornuate	1	0.30
Hypoplastic	17	5.40
Normal	152	48.60
Total	313	100.00

When separately analysed, those women having a definite male or female factor compromising fertility were also found to have almost the same incidence of uterine anomalies (Tables II and III). Nevertheless, among the 97 women with no obvious cause attributable for the infertility, 62 (63.90 per cent) had demonstrable abnormalities, again majority of them of subtler type (Table IV).

TABLE II

Uterine Malformations in Patients With a Definite Male Infertility Factor

Type of malformation	No.	%
Subseptate	8	9.90
Mild subseptate	12	14.80
Very mild subseptate	10	12.30
Planifundus	3	3.70
Bicornuate	2	2.50
Hypoplastic	6	7.40
Normal	40	49.30
Total	81	100.00

TABLE III

Uterine Malformations in Patients with a Definite Female Infertility Factor

Type of malformation	No.	%
Subseptate	10	12.30
Mild subseptate	11	13.60
Very mild subseptate	9	11.10
Planifundus	4	4.90
Bicornuate	3	3.70
Unicornuate	1	1.20
Hypoplastic	2	2.50
Normal	41	50.60
Total	81	100.00

TABLE IV

Uterine Malformations in Patients with No Obvious Cause for Infertility

Type of malformation	No.	%
Subseptate	11	11.30
Mild subseptate	21	21.60
Very mild subseptate	14	14.30
Planifundus	6	6.20
Bicornuate	3	3.10
Hypoplastic	7	7.20
Normal	35	36.10
Total	97	100.00

Interestingly, the incidence of uterine anomalies was significantly low in these

women who had no fertility problems and hence conceived without any form of treatment. Of the 54 women who became pregnant, only 18 (33.30 per cent) had abnormal uterine contour (Table V).

TABLE V

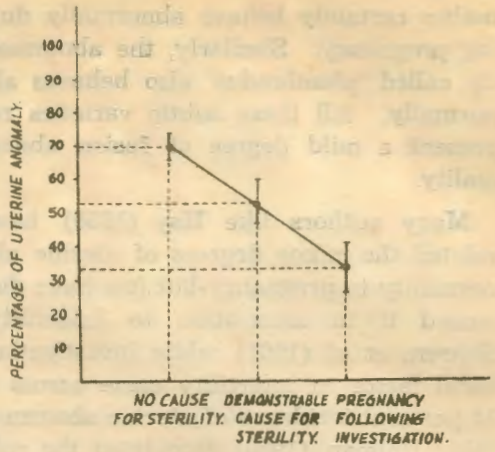
Uterine Malformations in Patients Who Became Pregnant After the Investigations

Type of malformation	No.	%
Subseptate	3	5.60
Mild subseptate	10	18.50
Very mild subseptate	1	1.80
Planifundus	1	1.80
Bicornuate	1	1.80
Hypoplastic	2	3.70
Normal	36	66.70
Total	54	100.00

The analysis suggests that about one half of the infertile population has demonstrable uterine anomalies in general. The fact that these anomalies are mainly of the major degrees must be taken note of. If properly scrutinised and separately analysed, women with obvious male or female factors can also be demonstrated to have about 50 per cent incidence of uterine abnormalities. However, the incidence of uterine anomalies is significantly high in those women who remain infertile for no obvious cause, and in this group for every 3 women 2 will have some type of abnormality. The converse is also true, that the incidence of uterine anomalies is remarkably low, and is only 1 in 3, in those women who became pregnant following the investigations (Chart I).

Discussions

Uterine malformations should no longer be viewed as a rare occurrence. The advent of hysterosalpingography, laparoscopy and hysteroscopy has stimulated interest in this group of conditions. While the literature is replete with discussions



Graph I

on classification of uterine malformations based on various methods, classification based on hysterographic appearance seems to be the most suitable, since the functional capacity of the uterus appears to be related more to the internal contour than the external appearance of the uterus.

Robins and Shapira (1931) defined the normal hysterogram as: The normal uterine cavity is triangular in shape, the base at the fundus and the apex directed below, at the level of the internal os. The lateral borders are usually slightly concave and the fundus is almost straight. Arguments that overdistention of the uterus by dye will produce defects that may be mis-classified are ill founded, because Robins and Shapira (1931) have proved that distention of the uterus occurs in the anteroposterior diameter and not in the lateral diameter. Some will have difficulty in accepting Hay's classification, especially the contours designated as 'mild subseptate' and 'very mild subseptate' as being abnormal. However, Hay's studies (1958) as well as those of others have demonstrated that some uteri of this type with minor degrees of ano-

malies certainly behave abnormally during pregnancy. Similarly, the abnormality called 'planifundus' also behaves abnormally. All these subtle varieties represent a mild degree of fusion abnormality.

Many authors like Hay (1958) have related the minor degrees of uterine abnormality to pregnancy but few have discussed it in association to infertility. Sobrero *et al* (1961) while investigating tubal factor in infertility came across a 14 per cent incidence of uterine abnormalities. Holman (1950) elucidated the role of juvenile uterus in infertile women. Robins and Spector (1961) considered congenital anomalies of the uterus as an important factor in infertility.

Falls (1956) has suggested that with the fusion defect of the mullerian duct system, there must be an associated defect in muscule, nerve, and blood supply to the uterus. Therefore, normal decidual reaction and nidation would not occur. This then may account for an association of infertility and an anomalous uterine contour.

Eventhough attempting to relate a minor uterine malformation to primary infertility is a tricky business, Nickerson (1977) has reported 74.21 per cent incidence of such anomalies in 190 primary infertility patients with no other discernible cause. According to him the high incidence of subtle uterine anomalies in his series indicates that there is a correlation between an abnormal hysterographic contour and primary infertility and that the subtler anomalies are more related to infertility than the severe fusion defects.

However, Nickerson (1977) has not analysed the incidence of uterine anomalies in all the infertility patients put together, which could have been compared with his figures for the selected group. Nor is there a comparative study with those women with an obvious cause for infertility. Likewise, what the incidence of such uterine malformations in women who became pregnant is also not reported.

Our study demonstrates the incidence of minor degrees of uterine abnormalities encountered in infertile women with no descernible cause. In addition, it also substantiates the correlation between subtle uterine anomalies and primary infertility, by providing for comparison with other groups of patients. Our incidence for uterine abnormality in the total infertile population is 51.40 per cent, in other words, roughly every other woman reporting for infertility workup will have an abnormal uterine contour. Incidentally, the percentage of uterine anomalies in those women with an obvious cause for infertility is also almost the same, those with female factors have 49.40 per cent and those with male factors having 50.70 per cent. But, the hysterogram revealed 63.90 per cent incidence of abnormalities, majority the subtler type, in those women with no descernible cause for infertility. This is certainly a higher incidence when compared with the general incidence of uterine anomalies in infertile women. This observation may lead to the logical conclusion that there is a correlation between subtle uterine anomalies and primary infertility. Interestingly, this conclusion is further substantiated by the very low incidence of uterine abnormalities in those women having no impediment for fertility and hence conceiving subsequent to the investigations. Among the women who became pregnant, only 33.30 per cent had demonstrable uterine abnormalities.

The authors feel that the cause-and-effect relationship between uterine anomalies and primary infertility may be further established if the presently reported frequency of abnormal contour can be compared with that of parous women in whom HSG is taken for some other purposes. It may also be worthwhile to effect a comparative study of incidence of pregnancy conceived, between women with normal uterine contour and those with subtle types of uterine anomalies, both groups having no obvious cause for infertility and exposed to unprotected intercourse for a specified period of 2 or 3 years.

Conclusion

Greater incidence (63.90 per cent) of uterine anomalies, especially the minor degrees, demonstrated in infertility patients with no other discernible cause, and a very low incidence of such defects (33.30 per cent) in those women who conceived following the investigations, lead to the logical conclusion that subtler anomalies of the uterus can be instrumental for primary infertility.

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See Figs. on Art Paper VIII-IX