A STUDY OF VAGINAL CYTOLOGY IN 38 CASES OF PROLONGED PREGNANCY

by

SNEHLATA MISRA*, M.D., D.G.O.,
Y. PINTO DO ROSARIO,** M.D.
PERVIZ HEERA,*** M.D., D.G.O.

Introduction

It is generally agreed that perinatal mortality in postmaturity is high. The collected figures give an average of about 4% perinatal loss in cases of postmaturity (Lewis 1964). The question is whether this loss is due to placental insufficiency or is due to mechanical factors. Clayton (1953), observes that deaths from postmaturity per se (i.e. placental insufficiency) are very rare. If the perinatal loss in postmaturity is related to placental insufficiency in some cases, it should be reflected in vaginal cytology which would then enable us to pick out the cases at risk from cases of simple prolonged pregnancy.

From studies on oestriol excretion alone, Banerjea (1962) and Ten Berge (1965) could find no significant fall in excretion values in pregnancies exceeding 40 weeks. However, authors who have carried out cytologic studies have claimed that certain cytological criteria give a definite indication of foetal risk. The various criteria which have been given importance by different authors are :

1. 'Post-partum' smear type with parabasal cells (Lichtfus 1959, Pundel 1959, Nyklicek 1959, Ezes *et al* 1953, Kummel 1965, Camplani 1965).
2. Persistence of 'Term' pregnancy smear beyond the cytologically determined date for delivery, i.e. over 5 days (Pundel 1959, Zidovsky 1961).
3. High K. P. I. (Kummel 1965).
4. Persistent cytolysis (Zidovsky 1961).

However, Jenny (1961), Poniatowska (1964) and Osmond Clarke *et al* (1964), have not been able to corroborate these findings and do not consider any particular smear type pathognomonic of prolonged pregnancy.

Material and Methods

Sixty-nine smears in 38 cases of pregnancy prolonged beyond 41 weeks were studied. There were 1(single smears in 16 cases and 53 se rial smears in 22 cases. In some of the serial smears, the first smear was taken before the 40th week. Of the 69 smears, 38 were taken after the

*Asst. Surgeon, Safdarjang Hospital, New Delhi.

**Addl. Prof., Lady Hardinge Medical College and Hospital, New Delhi.

***Specialist, Obst. & Gynaec., Safdarjang Hospital, New Delhi.

Received for publication on 5-12-1968.

42nd week. In this series there was foetal distress in 5 cases (13%) and perinatal loss in 4 cases (10.5%). Four of the thirty-eight babies showed evidence of retarded intrauterine growth, i.e. birth weight below 2500 grams.

The smears were taken from the right lateral vaginal vault under vision with a wooden spatula, spread on a micro-glass slide and immediately fixed in equal parts of 95% alcohol and ether. Papanicolaou's stain was used. Desquamation and karyopyknotic index were used to evaluate the slides.

Desquamation

Three types of smear patterns were observed: clumped, partly discrete and discrete.

Karyopyknotic Index

Evaluated by counting 200 cells under oil immersion lens.

Observations

Smear type in relation to term:- The smear pattern at different terms of pregnancy from 42 weeks onwards in 38 smears was studied to see if any one particular smear type predominated (Table I). The percentages of the various smear types remained the same at 42nd, 43rd and 44th weeks of pregnancy.

Summary of cases of foetal death

Two of these cases were associated with persistent cytolysis, two with high K.P.I. and one with persistent discrete smear for more than five days (Table II).

Table III shows the correlation of the adverse cytologic criteria with perinatal loss as compared with survivals. Persistent cytolysis was seen in 50% of cases with perinatal loss and only in 12% of survivals .

High K.P.I. was seen in 50% of perinatal deaths and only in 3% of survivals.

Persistent discrete smears were seen in 25% of perinatal loss and only in 6% of survivals.

I. High Karyopyknotic Index

Three cases showed high K.P.I. as under :

In one, K.P.I. increased from 8 at 40 weeks to 11 at 41 weeks, with foetal distress in labour and stillbirth at 42 weeks, the baby weighing 2300 grams.

In one, K.P.I. increased from 11 at 40 weeks to 15 at 41 weeks with spontaneous delivery at 41 weeks of a normal baby weighing 2900 grams.

TABLE I

Smear pattern at different weeks of pregnancy

Weeks	No. of smears	Clumped		Partly discrete		Discrete		Cytolytic	
		No.	%	No.	%	No.	%	No.	%
42	27	..	..	2	7.4	15	55.6	10	37
43	6	..	..	1	16.7	3	50	2	33.3
44 or more	5	..	..	..	..	3	60	2	40
Total	38	..	..	3		21		14	

TABLE II

Summary of cases with perinatal loss

Name	I	II	III	Remarks
1. SB	Partly discrete with K.P.I. 3 at 37 wks.	Discrete, K.P.I. 8 at 40 wks.	Discrete, KPI 11 at 41 wks.	Foetal distress in labour. Spontaneous delivery at 42 wks. Wt. 2,300 gms. stillbirth. Dry, wrinkled, meconium-stained skin.
2. M.	Cytolysis at 41 wks.	Cytolysis at 42 wks.	..	Foetal distress in labour. Spontaneous delivery at 42 wks. Wt. 2,350 gms. Dry, wrinkled, meconium-stained skin. Neonatal death after 3 hours.
3. G.D.	Partly discrete at 42 wks. KPI 4	Discrete at 43 wks. KPI 17.	..	Foetal distress in labour. Spontaneous delivery at 43 wks. Wt. 1800 gms. ; closed fontanellae, peeling of skin, long nails & wizened appearance. Neonetal death after 2 hours.
4. R..A.	Partly discrete at 37 wks. KPI 4	Cytolysis at 38, 39, 40, 41 wks.	..	Induced at 41 weeks. ARM & Syntocinon drip given. Foetal distress during labour. Forceps delivery. Baby Wt. 3000 gms. Smeared with thick meconium, dry & wrinkled skin, long nails, small closed fontanellae ; Neonetal death after 5 hours.

TABLE III

Smear pattern in relation to foetal prognosis

	No. of cases	Persistent cytolytic		Hi h K.P.I.		Persistent discrete	
		No.	%	No.	%	No.	%
Perinatal mortality	4	2	50	2	50	1	25
Survivals	34	4	12	1	3	2	6

In one, K.P.I. increased from 4 at 42 weeks to 17 at 43 weeks with delivery at 43 weeks of a baby weighing 1800 grams with foetal distress during labour and ending in neonatal death.

Thus of the three cases with high K.P.I., two ended in perinatal loss at or after 42 weeks with babies of low birth weight. The one case which ended in live birth delivered at 41 weeks (2900 grams).

2. Persistent cytolytic smears

Cytolytic smears were seen in 16 cases. In 6 single smears taken just before delivery there was no perinatal loss. In another four a single cytolytic smear was followed by a change to discrete or partially discrete with no perinatal loss. Persistent cytolytic smear was present in 6 cases. Two (33%) of these six cases ended in neonatal death with both the babies showing signs of postmaturity.

Parabasal Cells

These were present in one case only. The smear was taken at the onset of labour at 44 weeks and was followed by the birth of a healthy baby weighing 3000 grams with no signs of foetal distress or postmaturity.

4. Persistently discrete smear

It was found for over 5 days in 3 cases, in two it ended in the delivery of live babies and in one (33%) it ended in stillbirth weighing 2300 grams, ten days after the appearance of the second discrete smear.

Discussion

In this study no correlation has emerged between the degree of prolongation of pregnancy beyond the 41st week and the cytologic pattern. However, it is worth noting that no case showed a clumped or normal pregnancy pattern, and only 8% showed partly discrete or prior to term pregnancy pattern. The majority were either discrete or cytolytic type. Only one case out of 38 cases and 69 smears showed parabasal cells and was followed by the birth of a healthy baby.

Cytolysis was seen to be almost constant from 42 weeks onwards (37-40%). This finding is at variance with that of Lichtfus (1959) who found the percentage of cytolytic smears to decrease at term and in true postmaturity never found cytolysis. On the other hand, Zidovsky (1961), has reported on a study of 133 cytolytic smears in postmaturity.

Smear pattern in relation to foetal prognosis

Of the 38 cases studied there was a perinatal loss of 4, 3 neonatal deaths and 1 stillbirth, with all the babies showing signs of postmaturity. With the exception of one baby which weighed 3000 grams, these were all underweight babies in spite of prolonged pregnancy. The mechanical factor in the causation of perinatal death could be excluded in this series. Although a postmature baby has been defined as one weighing over 4000 grams, in India even the term babies are smaller in weight and hence, even in postmaturity small babies are likely to occur.

In each of the four cases one or more of the adverse cytologic criteria noted by earlier workers were present, persistent cytolysis in 50%, high K.P.I. in 50% and persistent discrete smear in 25%. Though Zidovsky (1961), commented on the prognostic significance of a cytolytic smear on the basis of foetal impairment, in 18.5% in this series an isolated cytolytic smear was not found to be of any prognostic significance, but when cytolysis persisted in serial smears 2 out of 6 (33%) ended in neonatal death. High K.P.I. is an adverse sign especially if it shows a steady rise and is associated with a small baby. In this series perinatal loss with a high K.P.I. has been as high as 67%.

In the only case showing parabasal cells, there was no foetal loss. Pundel and Lichtfus (1959), found an indication of danger to the baby and advised urgent induction of labour in the presence of parabasal cells. We therefore agree with Zidovsky (1961) and Poniatowska (1964), who also did not find the 'Postpartum' smear type to prove either the prolongation of the pregnancy or imminent intrauterine death. Horalek and Sonek (1959), and Misra (1967), found healthy babies born in the presence of parabasal cells.

Zidovsky (1961), also found that foetal death occurred in 13 out of 23

cases (56.5%) where the cytologically determined time limit for delivery was exceeded beyond 5 days. In this series foetal death occurred in 1 out of 3 cases (33%).

These cytological findings corroborate our present knowledge on the subject of postmaturity, that placental insufficiency due to postmaturity per se occurs in few cases, the majority of cases being of simple prolonged pregnancy with no foetal hazard.

Although in the whole series of 69 smears in 38 cases there was no effect of the degree of prolongation of pregnancy beyond the 41st week on the cytologic pattern, impending foetal loss in 4 cases was reflected in the smears.

Summary

A total of 69 smears (16 single and 53 serial) in 38 cases of pregnancy prolonged beyond 41 weeks were studied. In this series there was foetal distress in 5 cases (13%) and perinatal loss in 4 cases (10.5%), with signs of postmaturity in all the four. In each of the 4 cases one or more of the adverse cytological criteria were present, i.e. persistent cytolysis in 50%, high K.P.I. in 50% and persistent discrete smear in 25% as against 12%, 3% and 25% of the survivals respectively. Parabasal cells were present in one case. This smear was taken at the onset of labour at 44 weeks and the pregnancy ended in the delivery of a live healthy baby. Serial smears are imperative to detect impending foetal loss.

References

1. Banerjea, S. K.: J. Obst. & Gynec. Brit. Comm. **69**: 963, 1962.
2. Camplani, G.: Div. Obst. Ginecol. Osp. Magg., Bergamo—Quad. Clin—Obstet. Gynec. 1964. 19/3 (115-127). Quoted Excerpta Medica, **18**: 226, 1965,
3. Clayton, S. G.: Proc. Roy. Soc. Med. **46**: 91, 1953.
4. Ezes, H.: Ann. Endocr. (Paris). **14**: 463, 1953. Quoted by Zidovsky.
5. Horalek, F. and Sonek: Acta Cytol. **3**: 255, 1959.
6. Jenny, J.: Gynaecologia. **151**: 174, 1961.
7. Kummel, J. Menkhaus, G.: Zbl. Gynak. **87**: 180, 1965. Quoted J. Obstet & Gynec. Brit Comm. **72**: 640, 1965.
8. Lewis, T. L. T.: Progress in Clinical Obstetrics & Gynaecology ed. 2, 1964, J. & A. Churchill Ltd., p. 305.
9. Lichtfus, C.: Acta Cytol. **3**: 220, 1959.
10. Lichtfus, C.: Acta Cytol. **3**: 250, 1959.
11. Misra, A.: J. Obst. & Gynec. India. **17**: 481, 1967.
12. Nyklicek, O.: Acta Cytol. **3**: 258, 1959.
13. Osmond-Clarke, Murray, M. and Wood, C.: J. Obst. & Gynec. Brit. Comm. **71**: 231, 1964.
14. Poniatowska, T. I.: Klin. Ginek. pol. 1963, 34/5 (589-596).
15. Polozn, A. M. and Warszawa: Quoted Excerpta Medica Obstetrics & Gynaecology. **17**: 437, 1964.
16. Pundel, J. P.: Acta Cytol. **3**: 254, 1959.
17. Ten Berge, B. S.: Int. J. Fert. **9**: 321, 1964. Quoted Excerpta Medica Obst. & Gynec. **18**: 37, 1965.
18. Zidovcky, J.: Acta Cytol. **5**: 393, 1961.