Of 21 patients yielding isoniazid-resistant strains, 9 (44.4%) showed reversion to sensitivity within twelve months of the cessation of treatment. Certain factors which may determine reversion to sensitivity are discussed.

A variability in the sensitivity of different cultures from the same patient and in the clinical response to isoniazid of patients yielding resistant strains is noted. It is suggested that in some cases a combined infection with resistant and sensitive strains may exist and that the examination of a single sample of sputum may not reveal the sensitivity of the prevailing infection.

Certain practical implications of isoniazid resistance and of reversion to sensitivity are discussed. Attention is drawn to the dangers of giving isoniazid or marsilid to patients consistently yielding resistant strains: not only may reversion to sensitivity be delayed, but a dangerous exacerbation of the disease can be induced.

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SURGICAL INDUCTION OF LABOUR IN MODERN OBSTETRIC PRACTICE*

BY

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The risk of infection has ceased to play a dominating part in the management of obstetric cases since chemotherapeutic and antibiotic substances have shown themselves capable of either preventing or controlling this hazard. This had led to the more frequent employment of obstetric procedures which in the past were thought to predispose to the introduction or spread of infection of the genital tract. Caesarean section and manual removal of the placenta have perhaps been the most notable examples of this trend. There can be little argument that the effect, in regard to the employment

of these two procedures, has been beneficial for both child and mother. In our own practice during the last few years a similar trend has been noted in our employment of surgical induction of labour by artificial rupture of the membranes. This is a well-tried procedure the effects of which have been the subject of many reports in the last twenty years. A report by Gibson (1952) gives a comprehensive survey of the position up to that time.

The main objections to surgical induction of labour in the past have been the risk of infection to mother and child, especially in cases in which the latent period between induction and the onset of labour was prolonged, prejudice against the subsequent conduct of labour, especially with regard to the employment of caesarean section, and the poor chance of survival of a small child when the clinical estimate of foetal size before induction had been inaccurate. Under modern conditions these objections are, in our opinion, less valid, and consequently artificial rupture of the membranes can be employed in a greater variety of conditions than previously. Apart from cases of hypertensive toxæmia, the object in inducing labour should be to promote easy vaginal delivery of a healthy child of reasonable size without detriment to the mother. In hypertensive toxæmia the induction should be carried out either to remove the child from what is considered to be an unhealthy environment or to prevent advancing toxæmia. It is hoped that frequent employment of induction of labour should result in a low foetal mortality and that, in achieving this, resort to caesarean section should be necessary on as few occasions as possible.

A review of the cases in which surgical induction of labour has been performed during the years 1950, 1951, and 1952 in the maternity units at the County of Lanark Maternity Hospital, Bellshill, and the William Smellie Memorial Hospital, Lanark, was therefore undertaken. These cases have all been under our personal control, and we have been responsible for the policy of induction of labour and subsequent management.

During the years mentioned labour was induced by artificial rupture of the membranes in 1,585 cases. This represents 18.3% of all deliveries in the hospitals during this period. Thirty-one cases of ante-partum haemorrhage have not been included because of the doubt which exists in these cases whether they are already in labour at the time of induction and because of the difficulty of estimating the effect on the foetus.

Method

The usual practice was to puncture the amniotic sac with a male metal catheter or with the type of catheter described by Drew Smythe (1931). Either the forewaters or the hindwaters were punctured, the object being to allow the liquor amnii to drain away. In most cases the membranes were separated from the region of the internal os before the puncture was performed. The patient was then allowed to go into labour. Only in occasional cases in which the latent period was prolonged was medical induction given in addition. It was singularly unsuccessful in our hands, but pituitary extract was very seldom used. No regard has been paid to the condition of the cervix. Once the decision was taken to induce labour the membranes were ruptured whether the cervix was taken up or whether it was closed with a long narrow canal. Similarly no regard was paid to whether the head was fixed or free in taking the decision to induce labour.

Indications.—The main indications for induction are shown in Table I.

*The paper read by Dr. Tennent in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Glasgow, 1954, was based on this work.

TABLE I

Prolonged pregnancy	633 cases	} 84.2%
Hypertensive toxæmia	504 "	
Contracted pelvis	121 "	}
Large foetus	76 "	
Previous caesarean section	39 "	}
Unstable presentation	30 "	
False labour	27 "	}
Anencephaly and hydrocephaly	26 "	
Bad obstetric history	21 "	}
Oedema	19 "	
Rh iso-immunization	15 "	}
Urinary disease	14 "	
Hydramnios	9 "	}
Miscellaneous	51 "	

1,585

Results

Maternal Mortality.—There was one maternal death, giving a maternal mortality of 0.06%, or 0.66 per 1,000 live births.

Maternal Morbidity.—A temperature of 100° F. (37.8° C.) or over during the puerperium was noted in 39 cases. In only six of these did the fever persist for a period in excess of three days. Chemotherapy or antibiotic substances were used on 297 occasions. The main indication was for urinary infection in the puerperium, but on occasion they were used prophylactically. No frank case of maternal sepsis occurred.

Foetal Mortality.—Eighty-three infants were lost, giving a gross foetal mortality of 5.3%. When the unavoidable losses were excluded the corrected foetal mortality was 36 (2.3%). The details are shown in Table II.

TABLE II

Stillbirths	43	62 (3.9%)
Unavoidable	26	
Abnormalities incompatible with life	12	
Death <i>in utero</i> before induction	5	
Rh iso-immunization	19*	
Avoidable	4	
Neonatal deaths	21 (1.4%)	
Unavoidable	3	
Congenital abnormalities	1	
Rh iso-immunization	17 (1.1%)	
Avoidable		

* Of these 19 stillbirths, 10 were born of a mother suffering from hypertensive toxæmia.

Latent Period.—The efficiency of the method as judged by the length of the latent period is shown in Table III.

TABLE III

	Primigravidae	Multiparae
In labour within 24 hours	74.8%	72.5%
" " " 72	91%	88%
Failures (over 72 hours)	9%	12%

Length of Labour.—Labour lasted over 24 hours in 79 (10.9%) of the primigravidae, and only nine (1.2%) of these were undelivered after 48 hours. Among the multiparae the duration was over 24 hours in 40 cases (4.6%), and in nine (1.0%) of these over 48 hours.

Mode of Delivery.—The modes of delivery are best shown in Table IV.

TABLE IV

	Primigravidae	Multiparae
Spontaneous	585 (80.6%)	814 (94.8%)
Assistance in second stage	117 (16.4%)	24 (2.8%)
Caesarean section	24 (3.3%)	21 (2.4%)

The caesarean section rate for all cases was 2.9%.

Prolapse of Cord.—This occurred only once, in a case of hypertensive toxæmia. This child was stillborn.

Induction of Labour in Prolongation of Pregnancy

Prolongation of pregnancy was the most common indication for induction of labour in the series. Our object was to prevent dystocia and anticipate the danger of placental insufficiency. This was based on a clinical impression that, where pregnancy had lasted more than 41 weeks, large infants, dystocia, and foetal distress in early labour were common. Considerable support for this impression has come from the work of McKiddie (1949), Walker and Turnbull (1953), and Racker, Burgess, and Manly (1953).

It has been our policy to induce labour by artificial rupture of the membranes in cases in which pregnancy had

persisted beyond 287 days, provided there were reasonable grounds to presume that this duration was correct. Therefore the mother had to be able to recall the date of her last menstrual period to within a few days, and we had to assure ourselves that the child was not unduly small. Labour was induced for this indication in 633 cases—288 primigravidae and 345 multiparae. The results are shown in Table V.

TABLE V

	Primigravidae	Multiparae
Infants	1	3
Stillborn	2	2
Neonatal deaths	82	140
Weight over 8 lb. (3.6 kg.)	14	11
" " under 6 lb. (2.7 kg.)	230	271
Latent interval under 24 hours	24	35
" " over 72	258	334
Duration of labour under 24 hours	25	8
" " 24-48	5	3
" " over 48		
Mode of delivery		
Spontaneous	242	339
Forceps	42	3
Caesarean section	4	3

Of the eight infants lost, two had abnormalities precluding survival—namely, exomphalos and severe spina bifida. If these are excluded the corrected foetal mortality becomes 0.9%.

The tendency was for the infant to be large: 35.1% of the infants weighed over 8 lb. (3.6 kg.). As would be expected, the method was more efficient in this type of case than in the whole series, 79.1% of cases being in labour within 24 hours. Prolonged labour was infrequent, 93.5% of cases being delivered within 24 hours and labour lasting over 48 hours in only 1.3%. Delivery by forceps was necessary in 7.1% of cases—almost entirely in primigravidae. The caesarean section rate was 1.1%. Foetal distress was noted 20 times in the primigravidae and four times in the multiparae.

Induction of Labour in Hypertensive Toxaemia of Pregnancy

In common with general obstetric practice, hypertensive toxæmia has been a frequent indication for induction of labour and has been carried out in 504 cases—307 primigravidae and 197 multiparae. Our standard of classification for hypertensive toxæmia has been a diastolic blood pressure of 90 mm. Hg or more at complete rest in bed. Advancing and persistent toxæmia have been the main grounds for deciding that induction of labour was necessary. In addition, all cases showing evidence of hypertensive toxæmia at 38 weeks or later have been induced.

Our object has been to avoid the risk of placental insufficiency to the foetus once an adequate degree of maturity had been reached. The work of Walker and Turnbull (1953), Browne and Veall (1953), and Cox and Chalmers (1953) indicates that hypertension and placental insufficiency are closely related.

The results are as follows. Thirty-one infants were either stillborn or died before leaving hospital, giving a foetal mortality of 6.0%. Seven were known to be dead *in utero* before induction was carried out, in two the cause of death was Rh iso-immunization, and one had a foetal abnormality incompatible with life. When these are excluded the corrected foetal mortality becomes 4.1%.

The foetal mortality is strongly influenced by the severity of the toxæmia and the prematurity of the infants. In this series, where induction has been performed before 38 weeks the toxæmia has been of considerable severity. Among the 106 cases induced before 38 weeks the foetal mortality was 15.4%, but in the 398 cases induced after that time it was 3.3%.

The efficiency of the method was similar to that of the whole series, 70.4% of cases being in labour within 24 hours. However, 10.9% were still not in labour after 72 hours; in hypertensive toxæmia this is a great disadvantage, as is shown further on.

Delivery by forceps was necessary in 54 cases (10.5%), 49 of these cases being primigravidae. Eighteen cases (3.5%) were delivered by caesarean section—14 primigravidae and

4 multiparae. The indication was advancing toxæmia in 5 and foetal distress of dystocia in 13. Foetal distress was noted 29 times.

Induction of Labour in Contracted Pelvis

Surgical induction of labour before term as a method of management of contracted pelvis is not favoured by most obstetricians at the present time. There have, however, been some consistent advocates, such as Drew Smythe (1950). The main objections have been the possibility of infection should caesarean section become necessary in labour and the possibility of the production of a small child owing to inaccuracy in the estimation of the size of the foetus at the time of induction. As is shown below, the risk of infection in subsequent caesarean section is not a factor in modern practice, but the risk of the birth of unduly small infants is real. However, by reasonable precautions this risk can be reduced to a minimum.

It has been our objective to secure an easy vaginal delivery of a healthy child of reasonable but not large size. We have therefore selected only cases of minor degree of pelvic contraction for induction. The main type of contraction has been slight flattening at the brim with restriction of the upper part of the cavity as indicated by the loss of the normal sacral curve. The size and shape of the pelvis in these cases was estimated by radiological pelvimetry some time before the 38th week, when examination of the pelvis was made under thiopentone anaesthesia. At the same time the absence of disproportion between the foetal head and pelvis or otherwise was noted. If no disproportion was found, if the child was of reasonable size, and if prospects of easy vaginal delivery were good, surgical induction of labour was carried out. The subsequent management of the case was that of a trial labour. The 38th week was chosen as the time at which the chances of production of unduly small infants by clinical error in estimation of size were most likely to be low. In the early part of the series induction was considered any time after the 37th week, but this led to the birth of a small premature infant which did not survive.

Labour was induced surgically in 121 cases of contracted pelvis—53 primigravidae and 68 multiparae—selected as described above. The results are shown in Table VI.

TABLE VI

	Primigravidae	Multiparae
Infants		
Stillborn	1	0
Neonatal deaths	0	2
Weight over 8 lb. (3.6 kg.)	3	10
" under 5 lb. (2.3 kg.)	2	3
Latent interval under 24 hours	35	45
" over 24	6	8
Duration of labour under 24 hours	46	61
" " 24-48	7	6
" " over 48	0	1
Mode of delivery		
Spontaneous	35	59
Forceps	12	2
Assisted breech	0	1
Caesarean section	6	6

Of the three infants lost, one died of Rh iso-immunization and can be excluded. One child died of prematurity, and this must be directly attributed to the method. The stillbirth could not be explained, but the mother suffered from cardiac disease and was cyanosed throughout labour. The corrected foetal mortality was 1.7%.

Inaccurate estimation of the infants' weight before induction was evident in 18 (14.8%) of cases. This was of considerable importance in five (4.1%), in which the weight was under 5 lb. (2.3 kg.).

The efficiency of the method was slightly less than the average, as would be expected at 38 weeks, only 66.1% being in labour within 24 hours, but the failure rate was similar to that of the whole series. Prolonged labour was infrequent, only one case lasting over 48 hours. Only 14 (11.6%) cases required assistance by the forceps, and 12 of these were primigravidae. The caesarean section rate was 9.9%, the operation being performed in 12 cases, six being primigravidae. Eleven cases had had caesarean section per-

formed in a previous pregnancy; in seven of these vaginal delivery occurred. Foetal distress was noted eight times among the primigravidae and three times among the multiparae.

Large Foetus

In order to prevent dystocia we have used induction of labour to avoid the development of unduly large infants. The estimation of foetal size is notoriously unreliable, being dependent on the clinical impression derived from abdominal palpation. Occasionally the history of previous large infants is of help. Labour was induced for this indication in 76 cases—33 primigravidae and 43 multiparae. Only one infant was lost. Death occurred from pneumonia and atelectasis. The birth weight was 8 lb. 4 oz. (3.7 kg.). The latent interval was short—two hours—and labour lasted only four and a half hours. No infant weighed under 6 lb. (2.7 kg.), and only four weighed under 7 lb. (3.2 kg.). Fifty-five (72.4%) of these infants weighed over 8 lb. (3.6 kg.), 21 of them being over 9 lb. (4.1 kg.).

Prolonged labour was not frequent, only one case lasting over 48 hours.

Delivery was spontaneous in 67 cases, by forceps in seven (9.2%), and by caesarean section in two (2.6%). Foetal distress was noted four times.

Induction of Labour where Caesarean Section had been Performed in a Previous Pregnancy

In cases in which caesarean section had been performed in a previous pregnancy for an indication which did not recur it became our policy to induce labour at 38 weeks. Our object was to bring on labour when the child was on the whole smaller than the average size at term, and thus lessen the strain on the scar. Further, spontaneous rupture of the classical scar is most apt to occur in the last four weeks, and reduction of this period has been an advantage in the few cases in which this type of operation has been performed. Surgical induction of labour was carried out in 39 such cases.

There was one maternal death. This patient was in her fourth pregnancy. The first two pregnancies had resulted in stillbirths at term for which no adequate explanation could be discovered. Her third child was delivered by elective lower uterine segment caesarean section and had survived. The membranes were ruptured in her fourth pregnancy at 38 weeks. Labour began after an interval of 39 hours. After 10½ hours of labour acute foetal distress was noted and lower uterine segment caesarean section was again performed. The child was alive, weighing 8 lb. 13 oz. (4 kg.). The operation was difficult, being complicated by adhesions from the first operation. Paralytic ileus developed and the patient died on the fourth post-operative day despite gastric suction and parenteral fluids.

There was no foetal mortality, all the infants leaving the hospital alive.

The efficiency of the method was less than that of the series, as would be expected where labour is induced before term. Only 61.5% of cases were in labour within 24 hours, while 28.2% were still not in labour after 72 hours. These latter cases at first gave rise to some concern, but this prolonged latent period does not appear to have affected the ultimate results under modern conditions.

Only one child weighed over 8½ lb. (3.8 kg.). Easy vaginal delivery or delivery assisted by forceps at the outlet occurred in 89.8% of cases. It is our practice to deliver by the forceps in such cases when the second stage has been reached, unless this stage is completed with a few pains. Four cases (10.3%) required a further caesarean section.

Five cases (12.8%) had labours lasting over 24 hours, but in only one (2.6%) did labour last over 48 hours.

Other Indications

The remaining indications, as will be seen from Table I, are those of current obstetric practice and require little comment. Rh iso-immunization was regarded as an indication

for induction in the early part of the series only, and this practice has now been abandoned. We have not practised induction either for our own or for the patients' convenience. Perhaps the most lax indication has been "false labour." In certain cases in which a patient had been admitted to hospital at term supposedly in labour, and this has proved not to be so, labour has been induced to avoid psychological upset to the mother. The practice has at least caused no harm.

Throughout the series concern was felt over two questions—namely, the performance of caesarean section after surgical induction had been carried out, and the effect on the mother and child of a latent interval lasting over 72 hours. These two questions have therefore been examined in detail.

Caesarean Section after Artificial Rupture of the Membranes

Forty-five cases were delivered by caesarean section following surgical induction of labour by artificial rupture of the membranes. Twenty-four of these cases were primigravidae and 21 multiparae. The indications for caesarean section were:

	Primigravidae	Multiparae
Foetal distress	10	9
Dystocia	11	8
Advancing toxæmia	2	3
Prolonged latent period	1	1

Dystocia was usually of the type associated with disordered uterine action.

The two cases of so-called prolonged latent period—24 hours in an elderly primigravida and five days in a case in which a caesarean section had been performed in a previous pregnancy—occurred early in the series and might well have been observed for a longer period before deciding upon operation in the latter part of the investigation.

One patient, as has been described previously, died on the fourth post-operative day of paralytic ileus.

There was no case of frank sepsis. Six cases developed a temperature of 100° F. (37.8° C.) or more, but in only two did this persist for more than three days, and no patient was gravely ill.

One infant was stillborn. Induction had been carried out at term on account of toxæmia. Twelve and a half hours ensued before the onset of labour. After a labour lasting 47 hours lower uterine segment caesarean section was carried out on account of prolonged labour with disordered uterine action. The infant could not be resuscitated. The weight was 7 lb. 12 oz. (3.5 kg.).

In seven cases the latent interval lasted over 72 hours. In only one of these cases did a temperature of over 100° F. (37.8° C.) develop, and this persisted for only two days.

Antibiotics were given to 35 of these patients, most often as a prophylactic measure.

Latent Interval Over 72 Hours

A latent interval of over 72 hours between surgical induction and the onset of labour was noted in 166 cases. The periods of delay before the onset of labour were between three and seven days in 131 cases, between 7 and 14 days in 31 cases, and over 14 days in four cases. The longest interval was 43 days. In this case neither mother nor child suffered any upset.

There was no maternal mortality, and no case of frank maternal sepsis was seen. Low-grade pyrexia—that is, temperature not above 100° F. (37.8° C.)—was noted in 79 cases. In one case the temperature rose above 100° F. but subsided within three days. Chemotherapeutic or antibiotic substances were given to 47 cases. While this medication was usually either prophylactic or for urinary infection in the puerperium, it would have the effect of concealing any puerperal infection which resulted from a long interval with the membranes ruptured.

Twelve infants were stillborn and one died before leaving hospital, giving a gross foetal mortality of 7.8%. Four of these infants had gross abnormalities, and when these are excluded the corrected foetal mortality becomes 5.4%. In

four cases of hypertensive toxæmia and in one case of prolonged pregnancy foetal death occurred before the onset of labour. The neonatal death was in a child weighing 7 lb. 6 oz. (3.3 kg.). Necropsy showed atelectasis and pneumonia.

The distribution of latent periods over 72 hours according to the indication with the appropriate foetal results are shown in Table VII.

TABLE VII

Indication	No. of Cases	Foetal Results		
		Alive	Stillborn	Neonatal Death
Hypertensive toxæmia	54	48	5	1
Prolongation of pregnancy	59	58	1	—
Contracted pelvis	14	13	1	—
Previous caesarean section	11	11	—	—
Unstable presentation	7	5	2	—
Anencephaly	3	—	3	—
Large foetus	6	6	—	—
Urinary disease	2	2	—	—
False labour	2	2	—	—
Oedema	2	2	—	—
Bad obstetric history	1	1	—	—
Rh iso-immunization	1	1	—	—
Miscellaneous	4	4	—	—
Total	166	153	12	1

Discussion

The object of this review was to discover whether the frequent employment of surgical induction of labour by artificial rupture of the membranes as indicated above was safe and therefore of practical value. The relative efficiency of the method has been well established and is entirely similar in the present series to that previously recorded by one of us (Tennent, 1938). It is not ideal as regards efficiency, and we have used this method of induction for lack of a better.

There is no doubt that in perhaps many of the cases in this series induction of labour could be regarded as unnecessary interference, as a satisfactory maternal and foetal result could have been obtained had the patient been allowed to go into labour spontaneously. The value of the procedure must be judged on the overall results, and as it is in many cases an unnecessary procedure it should therefore be free from maternal risk. There was one maternal death—a rate below that for childbirth in the country as a whole. We feel that this death could be attributed to the performance of a second caesarean section and that the artificial rupture of the membranes was unconnected. Indeed, the case is a strong argument for the avoidance of repeat caesarean sections if this is possible.

The question of maternal infection is difficult to evaluate owing to the use of chemotherapy and antibiotics, but we feel, in the light of the results in this series, that, provided these substances are available, the possibility of infection is not a deterrent factor in considering the use of surgical induction of labour at the present time.

The foetal results must be considered in relation to the various indications.

The avoidance of prolonged pregnancy seems to be an advantage. The results in this series compare favourably with a similar number of cases going into labour spontaneously at term, and are in agreement with the work of Racker, Burgess, and Manly (1953). Obviously, difficult labour, instrumental delivery, and foetal distress have been infrequent.

Induction of labour in hypertensive toxæmia of pregnancy is such a common indication that the results here require little comment, but the foetal mortality after induction at 38 weeks in this series regardless of the degree of toxæmia is satisfactory enough to indicate that there is little reason for prolonging the risk of toxæmia beyond that date.

The results in contracted pelvis are, we feel, encouraging enough for use of the method in minor degrees of contraction. The main difficulty has been the estimation of the

foetal size before induction, error in which caused one neonatal death. A weight of 6 lb. (2.7 kg.) would appear to us to be the objective to give the best results. It may be that cephalometry will be able to help in this matter, and it is intended to explore this field. The foetal results in the other indications are good enough to justify the procedure from that aspect.

The subsequent course of labour and its management following surgical induction by artificial rupture of the membranes come now for consideration. The examination of three factors—the frequency of prolonged labour, the rate of instrumental delivery, and the caesarean section rate—should give a fair indication of the degree of difficulty experienced in the management of labour and delivery. Prolonged labour has been infrequent. Delivery by forceps has not been unduly frequent in any particular group. The caesarean section rate is worthy of more detailed examination. Our indications for caesarean section are liberal. We performed the operation in preference to a difficult vaginal delivery and where foetal distress appeared before easy vaginal delivery could be undertaken. Therefore the caesarean section rate is a fair indication of the occurrence of dystocia. The rate was 1.1% in prolonged pregnancy, 3.5% in hypertensive toxæmia, 9.9% in contracted pelvis, 2.6% in large foetus, 10.3% in previous caesarean section, and 2.9% for the whole series. We feel that this incidence is low in the light of publications giving the incidence of caesarean section, culminating in that of Jeffcoate (1953), in which an incidence of 15% is quoted. We believe that easy vaginal delivery is preferable to caesarean section for both mother and child, and that induction of labour is a good method of attempting to attain this objective. Should the attempt fail, caesarean section can, in our experience, still be safely undertaken.

The main objection to the method would appear to be the high incidence of cases which do not go into labour within 72 hours. This is, so far as we can judge from our series, a disadvantage to the foetus in hypertensive toxæmia and prolonged pregnancy. In these conditions five infants were lost before the onset of labour. It has been suggested by Gibson (1952) that such patients who do not go into labour within 72 hours in these conditions should be delivered by caesarean section. As no warning of foetal danger was evident in our cases such a policy would have involved the performance of 113 caesarean sections, 108 of which would have been unnecessary.

Conclusion

After reviewing this series of cases, we are of the opinion that the frequent use of surgical induction of labour in the conditions indicated above has contributed to a low foetal mortality, without maternal risk. We feel, further, that this has been obtained with a low caesarean section rate. We would make a plea for the more frequent use of surgical induction of labour, in the hope that fewer caesarean sections will be necessary. There is a need for a more efficient method of induction of labour to eliminate the cases with a prolonged latent period with its detrimental effects on the foetus in hypertensive toxæmia and prolonged pregnancy. We are at present supplementing the artificial rupture of the membranes by an intravenous "pitocin" drip where labour has not begun within 48 hours. The work of Carey (1954) and Faris and Kahlenberg (1954) would indicate that some hope that this will improve the efficiency of the method is justified.

Summary

A series of 1,585 cases in which labour was induced by artificial rupture of the membranes is reviewed.

The main indication for induction of labour in the series were hypertensive toxæmia of pregnancy; prolongation of pregnancy—that is, over 41 weeks; minor degrees of contracted pelvis; excessive growth of the foetus; and previous caesarean section.

There was only one maternal death—a rate of 0.66 per 1,000 live births. The corrected foetal mortality was 2.3%. The caesarean section rate was 2.9%.

The results according to the indication for induction in the various groups of cases are discussed.

A plea is made for the more frequent use of surgical induction of labour by artificial rupture of the membranes in the hope of reducing the number of caesarean sections performed.

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THE MANAGEMENT OF LABOUR IN CONTRACTED PELVIS*

BY

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It is singularly appropriate that the British Medical Association, on the occasion of its visit to Glasgow, should discuss the management of labour in contracted pelvis, because, ever since records have been kept in hospital, Glasgow has enjoyed the odious distinction of having the highest incidence of pelvic contraction in the United Kingdom.

Fifty years ago, in 1903, the incidence of contracted pelvis in the Glasgow Royal Maternity Hospital amounted to 27% of the admissions. Twenty-five years ago, in 1928, 9% of the admissions to the same hospital had contracted pelvis, and to-day the figure has fallen to 4%. Along with the lowered incidence there has been a corresponding improvement in the degree of pelvic contraction. In the early years the degree of contraction was so great that the patients could only be described as being deformed rachitic dwarfs. Even twenty-five years ago the degree of pelvic contraction was often extreme. In the past twenty-five years, however, there has been a noticeable and marked improvement in the degree of contraction. None the less, the cases of contracted pelvis which occur and with which we are concerned to-day are classified as such by generally recognized standards. In no case, for instance, was the true conjugate diameter at the brim more than 10 cm. Where it was as high as 10 cm. there was always other evidence of pelvic contraction, either in the cavity or at the outlet, before it was regarded as contracted.

Although the grosser manifestations of rickets are now a comparative rarity, I am personally convinced that nutritional and environmental factors are still responsible for the high incidence of the milder forms of pelvic contraction which exist in this region to-day, and that faulty

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