

AN EVALUATION OF THE ROUTINE USE OF SYNTOMETRINE WITH THE DELIVERY OF THE ANTERIOR SHOULDER AT THE QUEEN VICTORIA MATERNITY HOSPITAL*

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SUMMARY

An analysis of two years' deliveries (1959 and 1969) at Queen Victoria Maternity Hospital has demonstrated a marked fall in the postpartum blood loss, postpartum haemorrhage rate and duration of the third stage of labour, since the introduction of the routine use of Syntometrine with the delivery of the anterior shoulder of the infant. The rate of manual removal of the placenta has increased.

Comparison of our figures with others in the literature suggests that there is still scope for improvement, and tentative suggestions have been made with this goal in mind.

The management of the third stage of labour has for many years been a subject of contention and, as has been the case in many other situations in medicine, the pendulum has swung back and forth, in this instance from conservative to active management.

A century ago it was a recognized procedure to deliver the placenta by traction on the umbilical cord, after separation of the placenta had been ascertained by vaginal examination. It soon became obvious that this method was fraught with dangers in the hands of unskilled operators, and in 1861 Credé introduced the technique of expression or of squeezing the uterus with the first after-pain. Ahlfeld found that Credé's manoeuvre was associated in many instances with the same complications which Credé had recognized in cord traction, and he postulated his famous doctrine of 'Hands off the uterus'.

Thereafter followed a long period, well into the middle of this century, where conservative management of the third stage was predominantly employed. Hereby, the classical 'signs of separation' of the placenta were awaited, followed by attempted expulsion of the placenta by maternal efforts, or helped at this stage by fundal pressure or cord traction. This conservative regime of third stage management did not, however, provide the answer to reduction of blood loss, and postpartum haemorrhage remained a major cause of maternal morbidity and mortality.

It is now generally accepted that in the large majority of cases separation of the placenta occurs very soon after delivery of the foetus. This was well demonstrated by Brandt (1933),¹ who, by injecting sodium iodide into the umbilical vein immediately after delivery, and taking X-rays within 3 minutes of delivery, found placental separation in each of 30 cases studied. Thus the classical 'signs of separation' of the placenta—lengthening of the cord, rise and change of shape of the fundus of the uterus and the gush of blood, are not as a rule signs of placental separation, but are usually signs of placental descent.

As a result of this observation, and in view of the fact that increasing blood loss postpartum appeared to be directly related to the duration of the third stage, it became

obvious that the duration of the third stage should be shortened by artificial means. Brandt,¹ in the same paper, described a technique of lifting the uterus abdominally, while maintaining continuous cord tension (rather than traction), to be performed within 5-10 minutes of delivery. When the uterus rose, the placenta would lie free in the upper vagina, cervix or lower segment, and its expulsion was then aided by suprapubic pressure. In 1940, Andrews,² unaware of Brandt's work, described an almost identical technique, and it is now extensively employed with the attached eponym—the Brandt-Andrews manoeuvre.

A second component to active management of the third stage of labour, which has gradually become almost universally accepted, is the routine use of oxytocic drugs towards the end of the second stage of labour.

Embrey,³ using the puerperal uterus, showed the time relations to the onset of contraction of the uterus after various oxytocic injections to be as set out in Table I.

TABLE I. CONTRACTION OF THE UTERUS AFTER OXYTOMIC DRUGS

Drug	Route	Time
Ergometrine	Intravenous	41 s
Ergometrine	Intramuscular	7 min
Ergometrine + hyaluronidase	Intramuscular	4 min 47 s
Ergometrine + oxytocin	Intramuscular	2 min 37 s

The intravenous administration of ergometrine at the time of crowning of the head or the birth of the anterior shoulder has given the lowest incidence of haemorrhage, usually associated with an increased rate of manual removal of the placenta.⁴⁻⁶

However, the intravenous route of administration is not always convenient or possible, particularly where the delivery is conducted by a midwife. Ergometrine, given intramuscularly, is not entirely satisfactory due to the delayed onset of action. Improved results were obtained using intramuscular ergometrine with hyalase.^{7,8} In 1960, Sandoz Laboratories introduced the preparation Syntometrine (1 ml containing 5 units of synthetic oxytocin and 0.5 mg of ergometrine). Syntometrine, given intramuscularly, has been shown to be superior to intramuscular ergometrine alone in many reports.⁹⁻¹⁴ It has also been shown to compare favourably with ergometrine given intravenously.^{15,16}

MANAGEMENT OF THE THIRD STAGE OF LABOUR AT QUEEN VICTORIA MATERNITY HOSPITAL

Until the middle of 1966, third stage management at this hospital was by no means consistent. Conservative third stage management was still taught to the midwives, and oxytocic administration at the end of the second stage was confined to the doctors. The third stage of 'problem' cases was managed as a rule by the medical staff, and as the reports of oxytocic administration at the end of the second stage appeared, so these preparations were more and more frequently employed. Intravenous ergometrine, intramuscular ergometrine with hyalase and later intramuscular

*Date received: 30 June 1970.

Syntometrine were all used as each was in vogue.

However, it must be stressed that the majority of cases delivered received no oxytocic before completion of the third stage. In mid-1966 the routine administration of 1 ml Syntometrine by intramuscular injection with the delivery of the anterior shoulder, followed by delivery of the placenta by a modified Brandt-Andrews manoeuvre with the first uterine contraction, was introduced for all deliveries conducted by doctors and midwives alike. This procedure is still in use.

The Present Study

Since the introduction of the above procedure, it has been obvious that there has been a significant decrease in the blood loss during the third stage, and particularly in the postpartum haemorrhage rate. Furthermore, it appears that the rate of manual removal of the placenta has increased markedly. Finally, although our postpartum haemorrhage rate has been much reduced, we felt that our results were not as impressive as those published by other authors.

With the idea of confirming these impressions, it was decided to analyse a complete year's deliveries (1969) at this hospital, representing the routine use of Syntometrine with the delivery of the anterior shoulder, and then to compare these figures with those of 1959, when third stage management, with occasional exceptions, was conservative.

1969 Series

A total of 3 706 cases were studied. These represent all cases delivered at the hospital with the exception of caesarean sections, cardiac patients (as most of these patients had oxytocics omitted from their third stage management) and patients delivered by the district midwifery service. Cases were divided into two groups:

Group A: All cases considered 'abnormal' (in that conditions predisposing to postpartum haemorrhage existed) were included in this group. Thus it comprises patients with one or more of the following features:

- Grande multiparity (para 5 or more)
- Multiple pregnancy
- Hydramnios
- Major antepartum haemorrhage
- Breech presentation
- Instrumental delivery
- Prolonged labour
- Stimulated labour (either Syntocinon induction or intrapartum Syntocinon)

Group B: All cases not in the above categories were included in this group. Most other series in the literature have specifically dealt with similar 'normal' groups of patients.

Blood loss from episiotomies and cervical and perineal tears has not been differentiated or excluded. However, this feature is common to most other series, and will represent a common error in both the 1969 and 1959 studies in this paper.

Table II shows the distribution of blood loss, the postpartum haemorrhage rate, the incidence of manual removal of the placenta and the incidence of retained products of conception requiring secondary manual exploration of the uterus, or subsequent dilatation and curettage.

TABLE II. BLOOD LOSS, POSTPARTUM HAEMORRHAGE RATE, MANUAL REMOVAL RATE AND INCIDENCE OF RETAINED PRODUCTS—1969

	Group A		Group B		Total	
	No.	%	No.	%	No.	%
No. of cases	1 243	100	2 463	100	3 706	100
Blood loss						
0 - 150 ml	437	35.2	1 209	49.0	1 646	44.5
151 - 300 ml	472	38.0	814	33.1	1 286	34.6
301 - 599 ml	214	17.2	288	11.8	502	13.5
600 - 999 ml	92	7.4	104	4.2	196	5.4
1 000 - 1 500 ml	18	1.4	35	1.4	53	1.4
1 500 ml and over	10	0.8	13	0.5	23	0.6
PPH rate (i.e. 600 ml +)	120	9.6	152	6.1	272	7.4
Manual removal	64	5.1	69	2.8	133	3.6
Retained products	10	0.8	10	0.4	20	0.5

TABLE III. DURATION OF THIRD STAGE—1969

Duration of third stage	No. of cases	%
0 - 5 min	2 907	78.5
6 - 10 min	560	15.0
11 - 20 min	139	3.8
21 - 30 min	60	1.6
30 min and over	40	1.1
Total	3 706	100

Table III shows the distribution of third stage duration. Groups A and B are not considered separately.

1959 Series

As with the 1969 series, all patients were considered, with the exception of those delivered by caesarean section, cardiac patients and those delivered by the district midwifery service. A total of 3 777 cases were studied. They were similarly divided into groups A and B, using the same criteria as before. Tables IV and V show the results of the 1959 series.

TABLE IV. BLOOD LOSS, POSTPARTUM HAEMORRHAGE RATE, MANUAL REMOVAL RATE AND INCIDENCE OF RETAINED PRODUCTS—1959

	Group A		Group B		Total	
	No.	%	No.	%	No.	%
No. of cases	1 067	100	2 710	100	3 777	100
Blood loss						
0 - 150 ml	232	22.5	948	34.5	1 180	31.4
151 - 300 ml	350	34.0	820	29.8	1 170	31.1
301 - 599 ml	248	24.1	575	20.9	823	21.5
600 - 999 ml	161	15.7	303	11.1	464	12.3
1 000 - 1 500 ml	25	2.4	85	3.1	110	2.9
1 500 ml and over	13	1.3	17	0.6	30	0.8
PPH rate (i.e. 600 ml +)	199	19.4	405	14.8	604	16.0
Manual removal	54	5.3	29	1.1	83	2.2
Retained products	16	1.6	7	0.3	23	0.6

TABLE V. DURATION OF THIRD STAGE—1959

Duration of third stage	No. of cases	%
0 - 5 min	1 937	51.2
6 - 10 min	1 132	30.1
11 - 20 min	566	15.0
21 - 30 min	81	2.1
30 min and over	61	1.6
Total	3 777	100

DISCUSSION

It is immediately apparent that the change in third stage management, as discussed previously, has resulted in a marked decrease in postpartum blood loss and particularly in postpartum haemorrhage rate. In the group A cases the postpartum haemorrhage rate decreased from 19.4% in 1959 to 9.6% in 1969; in the group B cases from 14.8% to 6.1%; and in the combined group from 16.0% to 7.4%. In Fig. 1 it can be seen that the over-all blood

loss, even below the postpartum haemorrhage level, has been significantly reduced.

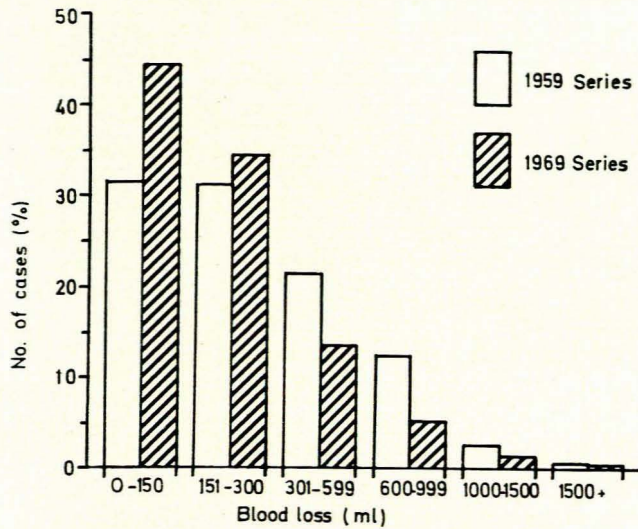


Fig. 1. Comparison of blood loss in 1959 and 1969.

Our impression that our present postpartum haemorrhage rate, although much improved, is considerably higher than figures presented in other similar series using Syntometrine, has been confirmed. Table VI shows the results of several reported series of 'normal' cases.

TABLE VI. POSTPARTUM HAEMORRHAGE RATE: COMPARISON OF SEVERAL SERIES IN WHICH SYNTOMETRINE WAS USED BEFORE DELIVERY OF THE PLACENTA

Author	No. of cases	PPH incidence (%)
Embrey <i>et al.</i> ⁹	590	2.9
Chalmers <i>et al.</i> ¹⁰	500	4.6
Kemp ¹¹	100	2.0
Bonham ¹²	391	1.3
Stearn ¹⁵	335	2.7
Basu & Shanks ¹³	300	3.6
Francis <i>et al.</i> ¹⁴	171	2.3
Schokman ¹⁶	445	1.2
Present series (B group)	2 463	6.1

A possible explanation for our still too high postpartum haemorrhage rate, is that there still exists a faulty understanding and execution of the active management of the third stage, particularly by the midwives. It is our routine to give the Syntometrine intramuscularly with the birth of the anterior shoulder. Theoretically, very slow delivery of the foetal trunk should follow, so that the oxytocic has started to act before delivery of the infant is complete. However, in practice, the foetal trunk is usually delivered rapidly. Moreover, in the flurry of delivery, the Syntometrine is frequently given too late. The result is that the placenta is frequently obstructed by a strong contraction between the upper and lower uterine segments. Thus the modified Brandt-Andrews manoeuvre of elevation of the fundus and controlled cord tension, all too often terminates in excessive cord traction. Administration of the Syntometrine with the crowning of the head is a technique which warrants consideration. A possible hazard of this is the occurrence of shoulder dystocia, but according to

Cunningham,¹⁷ the sustained uterine contraction prevents this complication.

Understandably, hand in hand with the diminished blood loss, the duration of the third stage is strikingly reduced in the 1969 series. This reduction of duration is most marked in the below-20-minute groups, although the incidence of prolonged third stages (more than 30 minutes) is also somewhat reduced. This is illustrated in Fig. 2.

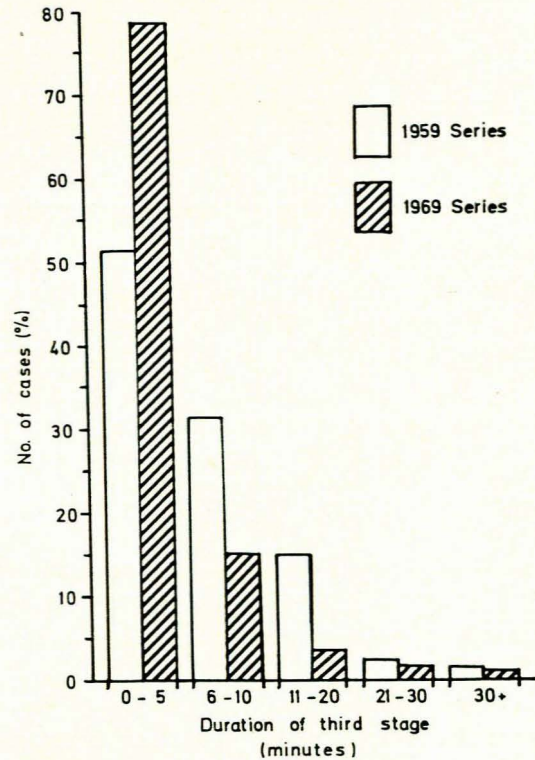


Fig. 2. Comparison of duration of third stage in 1959 and 1969.

The rate of manual removal of the placenta has increased from 2.2% in 1959 to 3.6% in 1969. This is an accepted disadvantage of the administration of oxytocics before delivery of the placenta. It is of interest that the manual removal rate in both the 1959 and 1969 series is significantly higher in the A or 'abnormal' groups. These removals were mainly done under sedation with Omnopon or morphia. In Table VII our 1969 group B or 'normal' series is compared with other normal series in the literature where Syntometrine has been given intramuscularly.

TABLE VII. RATE OF MANUAL REMOVAL OF THE PLACENTA: COMPARISON OF SEVERAL SERIES IN WHICH SYNTOMETRINE WAS USED BEFORE DELIVERY OF THE PLACENTA

Author	No. of cases	Manual removal (%)
Embrey <i>et al.</i> ⁹	590	1.5
Chalmers <i>et al.</i> ¹⁰	500	3.4
Kemp ¹¹	100	0
Bonham ¹²	199	2.0
Stearn ¹⁵	335	0.6
Basu & Shanks ¹³	300	1.3
Francis <i>et al.</i> ¹⁴	171	1.8
Schokman ¹⁶	445	1.4
Present series (B group)	2 463	2.8

In our unit, avulsion of the cord more often than not is followed by manual removal of the placenta. This radical approach undoubtedly explains our high incidence of manual removal of the placenta. Provided that there is no active bleeding, our approach should probably be more conservative. Stearn,¹⁵ analysing 58 cases of cord avulsion, found that manual removal was only required in 4 (6.9%).

It has been believed that a further disadvantage of the Brandt-Andrews manoeuvre is a high incidence of retained cotyledons. As the incidence of retained products requiring subsequent exploration is virtually identical in both series (0.6% in 1959 and 0.5% in 1969), it seems likely that this presumption is incorrect.

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