can correlate these with the clinical findings. It may be argued that a bacteriological report which deliberately admits the presence of doubt in the significance of the culture results is less liable to bias the clinical observer than a strictly quantitative assessment in terms of a set of figures which may give a spurious impression of accuracy and which, in any case, may in certain circumstances be unreliable (Kass, 1955).

The present series, contrary to the results reported by other workers, contains a substantial proportion of cases in which counts between 10,000 and 100,000 organisms per ml. were obtained. In part this could be explained by the fact that the urine specimens submitted for culture were selected on the basis of the microscopy of the deposit as explained above. It is also possible that deficiencies in the technique of collection and storage of the specimens were partly responsible. This does not, however, appreciably affect the findings of this investigation, which was not designed to survey an unselected series of patients or to assess the incidence and significance of asymptomatic bacteriuria, but to compare the pour-plate technique with the method already in use at this hospital.

We do not feel that the pour-plate technique is reliably capable of demonstrating the presence of "significant bacteriuria" in cases where the semi-quantitative method here described fails to reveal infection of the urine. None of the specimens in the clinically infected group in which over 100,000 organisms per ml. of urine were demonstrated by the pour-plate method was reported as "sterile" or showing "no significant growth," and Fig. 1 shows the good general agreement between the two methods. Identification cultures and smear examination are in any case essential, and there-

fore we do not think that the extra labour involved in setting up pour plates is justified by an increased sensitivity in the detection of subclinical infections of the urinary tract. We also think that this extra labour limits its usefulness as a screening procedure for the examination of large numbers of urine specimens. It is suggested that a simpler method, such as the one of Turner (1961) modified to yield less heavy growth, may be more appropriate for this purpose.

Summary

One hundred clean voided urine specimens were examined in parallel by the pour-plate counting method and by a routine semiquantitative method. There was close agreement between the two methods.

Subsequent evaluation of the reports by clinical follow-up for three months demonstrated no worth-while advantage for the extra labour involved in plate-pouring.

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USE OF "SYNTOMETRINE" IN PREVENTION OF POST-PARTUM HAEMORRHAGE

BY

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The traditional conservative attitude to the management of the third stage of labour is changing. With the realization that it materially reduces the incidence of post-partum haemorrhage, the routine administration of an oxytocic with the birth of the head or anterior shoulder is becoming increasingly common and no longer has to be justified. Discussion nowadays centres on the particular type of injection most suitable for routine use. Obstetricians commonly inject ergometrine intravenously, as advised by Davis (1940), Lister (1950), and Martin and Dumoulin (1953). But for routine use by midwives, or when intravenous injection is not possible, ergometrine intramuscularly, with or without hyaluronidase, has been advocated (Flew, 1947; Daley, 1951; Kimbell, 1954; Dutton, 1958).

Fostered by the availability of the pure synthetic hormone, the newest phase in the prophylaxis of post-partum haemorrhage has seen a return to the posterior pituitary hormone oxytocin. Oxytocin has the disadvantage that its duration of action is shorter than that of

ergometrine, so that delayed haemorrhage is more likely, but it acts more quickly than ergometrine by intramuscular injection. For routine use, therefore, the two drugs might with advantage be combined. Recently a stable solution containing oxytocin 5 units and ergometrine 0.5 mg. has been produced ("syntometrine"). It aims to combine in a single ampoule ready for immediate injection the rapid action of oxytocin with the more sustained action of ergometrine.

In a recent tocographic study (Embrey, 1961) the speeds of action of syntometrine and the ergometrine preparations were compared; syntometrine was revealed as the best substitute for intravenous ergometrine, suggesting that it might be commended for use when intravenous therapy is impracticable. We determined, therefore, to submit syntometrine to clinical trial, comparing its effectiveness in preventing post-partum haemorrhage with that of intramuscular ergometrine, the use of which had been routine practice in this department.

Method

Two groups of patients were studied. The main series comprised 590 patients who were given an intramuscular injection of syntometrine with the birth of the anterior shoulder. The control series, also numbering 590, received instead an injection of ergometrine 0.5 mg. intramuscularly.

The cases studied were all normal deliveries conducted by midwives, or by pupil midwives or medical students under the supervision of midwives. Patients delivered by doctors—for example, forceps, breech, twins, ante-partum haemorrhage, previous post-partum haemorrhage—were not included in the investigation, as in many of these intravenous ergometrine was used. Except for these exclusions the patients were consecutive admissions, and were all delivered spontaneously after less than 48 hours' labour.

The distribution of cases between the main and control groups posed no difficulty. The obstetric division of the Radcliffe Infirmary, Oxford, comprises a university unit and an "area" unit—to which booked and emergency cases of similar type-distribution are admitted in like numbers. The two units share a common nursing staff. Cases in the university unit were given the syntometrine injection and formed the main series. Patients admitted to the area unit continued to receive intramuscular ergometrine as hitherto and made up the control group. The patients were thus unselected, and the random distribution of midwives between the two groups ensured, so far as was possible, that nursing management was the same in each.

An active management of the third stage was practised and an attempt made to express the placenta by fundal pressure when the uterus was first felt to be contracting strongly. All blood lost was collected in a dish pressed against the vulva and carefully measured. If the loss amounted to more than 10 oz. (285 ml.) or if delivery of the placenta was delayed three-quarters of an hour a doctor was summoned.

Results

The results are summarized in Table I.

TABLE I

	Syntometrine	Ergometrine
Post-partum haemorrhage	2.9%	6.6%
Manual removal of placenta ..	1.5%	1.4%

Post-partum Haemorrhage.—The overall figures showed a significant reduction in the incidence of post-partum haemorrhage—an estimated loss of more than 20 oz. (570 ml.)—from 6.6% in the ergometrine group to 2.9% in the syntometrine group. Applying the χ^2 test to a (2 × 2) contingency table, this difference is seen to be highly significant ($P=0.017$). The results were re-examined for any source of bias which might limit the value of comparison between the two groups. The trial was planned to ensure, so far as was possible, that the composition of the two groups was similar, and in most respects—for example, age, maturity—this was successful. Nevertheless, the data showed a difference in parity distribution between the two series—the proportion of primigravidae being 35.3% among the syntometrine cases and 31.7% in the ergometrine group. The influence of parity was seen in detailed analysis of the results (Tables II and III). In primigravidae the incidence of post-partum haemorrhage was 4.8% in the

ergometrine group and 2.4% in the syntometrine group. In multigravidae the figures were 7.4% and 3.1% respectively. In both groups the incidence of post-partum haemorrhage was higher in multigravidae than in primigravidae, though the differences are not statistically significant. The results showed, further, that the severity of the post-partum haemorrhage was less in the syntometrine group than among the ergometrine cases. In none of the syntometrine cases was the loss recorded as more than 30 oz. (850 ml.), and only one required blood transfusion at the time. In the ergometrine group the loss was more than 30 oz. (850 ml.) in 12 cases, and 20 cases required blood transfusion.

TABLE II.—Primigravidae

	Syntometrine		Ergometrine	
	No.	%	No.	%
Total No.	208	100	187	100
Post-partum haemorrhage ..	5	2.4	9	4.8
Loss more than 10 oz. (285 ml.)	19	9.1	26	13.9
Third stage more than 10 minutes	7	3.4	10	5.3
Manual removal of placenta ..	5	2.4	5	2.7

TABLE III.—Multigravidae

	Syntometrine		Ergometrine	
	No.	%	No.	%
Total No.	382	100	403	100
Post-partum haemorrhage ..	12	3.1	30	7.4
Loss more than 10 oz. (285 ml.)	54	14.1	66	16.4
Third stage more than 10 minutes	10	2.6	13	3.2
Manual removal of placenta ..	4	1.0	3	0.8

Average Blood Loss.—The average blood loss was less in the syntometrine group than in the ergometrine group. In primigravidae (excluding cases of post-partum haemorrhage) a blood loss exceeding 10 oz. (285 ml.) occurred in 13.9% of the ergometrine group, but in only 9.1% of the syntometrine group; the corresponding figures for multigravidae were 16.4% and 14.1%. It should be stressed, however, that these differences have no statistical significance. In any event, it would be dangerous to attach too much importance to these figures. While every care was observed, the accurate estimation of blood loss is notoriously difficult.

Duration of Third Stage.—Compared with ergometrine there was a trend in the syntometrine series towards shortening of the third stage. In primigravidae the third stage was completed within 10 minutes in 96.6% of the syntometrine cases compared with 94.7% of the ergometrine cases; the corresponding figures for multigravidae were 97.4% and 96.8%. These differences are not statistically significant. However, the figures corroborate that the third stage is quickly completed in the great majority of cases when it is actively managed with the injection of an oxytocic (syntometrine or ergometrine) with the birth of the anterior shoulder.

Manual Removal of Placenta.—In primigravidae manual removal of the placenta was required in 2.4% in the syntometrine group and in 2.7% of the ergometrine group. In multiparae the corresponding figures were 1% and 0.8%. These differences are not statistically significant—suggesting, as might be expected, that there is no greater risk of imprisonment of the placenta with syntometrine than with ergometrine. It will be noted that in both series manual removal of the placenta was more often required in primigravidae than in multiparae.

Comment

That the routine administration of an oxytocic with the birth of the baby brings a worth-while reduction in the incidence of post-partum haemorrhage is well established (Lister, 1950; Daley, 1951; Kimbell, 1954). It seemed unnecessary, therefore, to examine a control series of patients, managed traditionally without an oxytocic at the end of the second stage: our object was merely to compare the effects of syntometrine as a prophylactic against post-partum haemorrhage with those of ergometrine.

The results show that both the incidence and the severity of post-partum haemorrhage in a group of normal patients given intramuscular syntometrine with the birth of the anterior shoulder were significantly less than in a similar group of cases given intramuscular ergometrine. Both in primigravidae and in multigravidae the post-partum haemorrhage rate was approximately halved. Moreover, there was evidence that the average loss was reduced in the syntometrine series and that fewer blood transfusions were required.

That the incidence of post-partum haemorrhage was higher in multigravidae than in primigravidae in both the syntometrine and the ergometrine series (though contrary to Dutton's (1958) findings) occasioned us no surprise—suggesting as it does that the multiparous uterus retracts less well than the primigravid organ.

Critics of the technique have stressed that the administration of ergometrine at the end of the second stage carries a risk of retention of the placenta. That there is some risk must be admitted, but Dutton's (1958) incidence of manual removal was not increased and there is little doubt that the danger has been exaggerated. There was no significant difference in the incidence of manual removal of the placenta in the syntometrine and ergometrine series, nor—remembering the composition of syntometrine—would this be expected. The placenta is no more likely to be imprisoned with syntometrine than with ergometrine. In this study manual removal of the placenta was more often required in primigravidae than in multiparae. It would seem that the better uterine retraction in primigravidae which limits the risk of haemorrhage increases the incidence of imprisonment of the placenta. The same trend—possibly similarly explained—was observed in relation to the length of the third stage, which in both series was more often prolonged in primigravidae than in multiparae.

The risk of incarceration of the placenta is, in our view, overshadowed by the far greater danger of imprisonment of the second of twins (undiagnosed) should syntometrine—or for that matter any other oxytocic—be inadvertently injected with the birth of the first. There was one case of undiagnosed twins in this series. Fortunately, skilled help was to hand—the uterine spasm was counteracted by halothane anaesthesia, and the second twin was extracted alive. But we have seen the second of twins lost in this way, and we cannot emphasize too strongly the need for care in diagnosis if this mishap is to be avoided.

The results of this trial confirmed an earlier favourable impression (Embrey, 1961) of the use of intramuscular syntometrine in the prophylaxis of post-partum haemorrhage. Compared with ergometrine alone, syntometrine resulted in an appreciable reduction of post-partum haemorrhage without any increase in the

incidence of imprisonment of the placenta or other adverse effect.

We believe that syntometrine is the best intramuscular oxytocic preparation available for routine use. Perhaps the greatest recommendation we can add is that the technique quickly won the approval of the nursing staff, who realized that the incidence of haemorrhage was reduced. We have generally found midwives highly critical of new unproved methods, and they certainly hold no brief for purposeless innovations.

In commending the use of syntometrine we would emphasize that the injection of any oxytocic at the end of the second stage should be combined with an active management of the third stage of labour. The traditional signs of placental separation should not be awaited. The injections should be exactly timed and when the uterus actively contracts a purposeful attempt should be made to express the placenta. In the present study this was mostly by fundal pressure, but—like Spencer (1962)—we have been impressed by the use of cord traction in personally conducted cases. We believe that the method is going to be used more frequently in the future.

Summary

A clinical trial of intramuscular syntometrine in the active management of the third stage of labour and the prophylaxis of post-partum haemorrhage is described.

Compared with the better-known intramuscular ergometrine injection, syntometrine resulted in a significant reduction in the incidence of post-partum haemorrhage; in both primigravidae and multigravidae the frequency of post-partum haemorrhage was approximately halved. There was no increase in the incidence of retention of the placenta.

For routine use by the unaided practitioner or midwife, when intravenous therapy is impracticable, syntometrine can be recommended.

We wish to express our thanks to Professor J. Chassar Moir for his advice, and we are indebted to Mr. J. Stallworthy and Mr. W. Hawksworth for permission to study patients under their care in the control series. We also acknowledge the co-operation we received at all times from the members of the nursing staff.

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Almost 400,000 school pupils aged between about 5 and 17 will be involved in a dental health campaign to be held in the West of Scotland towards the end of this year. The theme of the campaign will be "The Happy Smile." The primary target will be the biggest campaign of its kind organized in Britain and is aimed to bring home to pupils—and their parents—the need to look after their teeth properly. The campaign is being carried out at the request of the Scottish Standing Committee on Dental Health Education, which has pointed out that children's teeth are in a worse condition than during sweet rationing. The committee estimated that the average 5-year-old has seven of his twenty temporary teeth decayed, filled, or already extracted. The main reason for this is the increased consumption of sweets, "lollies," fruit drinks, and biscuits between meals.