

	Duration of current use (months)				All current use	All former use
	0	1-59	60-119	≥120		
Standardised rate* (No)	0.39 (82)	0.33 (10)	0.18 (4)	0.58 (5)	0.32 (19)	0.32 (66)
Risk relative to never users	-	0.85	0.46	1.49	0.80	0.82
95% Confidence interval	-	0.44 to 1.64	0.17 to 1.25	0.60 to 3.68	0.49 to 1.32	0.59 to 1.13
Period of observation (women years)	194 267	65 558	31 674	8 605	105 947	174 314

* Indirectly standardised for age and parity at diagnosis, social class, and smoking history at recruitment; expressed as rates per thousand women years.

diabetes mellitus which occurred for the first time during the study; those that occurred before recruitment and those diagnosed during pregnancy were excluded (together with the associated periods of observation). Each event was categorised according to the woman's contraceptive state at the time of diagnosis. The rates were indirectly standardised for age and parity at diagnosis, social class, and smoking history at recruitment. Fuller details of the study were published elsewhere.⁵

The table shows the incidence of reported cases of diabetes mellitus (International Classification of Diseases, 8th edition, code 2500) in each contraceptive group. There was no evidence of an increased risk among the current users (relative risk 0.80, 95% confidence interval 0.49 to 1.32), even in those who had used the pill for a long period. Similarly, there was no evidence of an association between diabetes and former use of the pill (relative risk 0.82, 0.59 to 1.13).

It seems unlikely that bias could explain our findings. Differential diagnostic criteria, patient reporting, or loss of patients between the contraceptive groups would usually produce an increased incidence rate in pill users.⁵ In our previous report a history of bearing a heavy baby or a positive family history of diabetes (both indicators of increased diabetic risk) did not

influence the use of oral contraceptives in our study population.⁴

Comment

Since routine biochemical measurements were not performed we do not know how many of the women in our study experienced a deterioration in glucose tolerance. Other workers have shown that a number of pill users will develop glucose intolerance.¹⁻³ Our study population is likely to have been subjected to similar metabolic effects, particularly since much of the exposure was to "high dose" pills, which may produce greater adverse effects than "low dose" brands. It is reassuring, therefore, to report that neither current nor former use of the pill increased the woman's risk of diabetes mellitus.

Since our last report there has been a substantial increase in the number of events and in the number of periods of observation reported to this study. This allowed us to investigate whether the prolonged use of oral contraceptives increases a woman's risk of diabetes. No such increase was shown, even in those who had used oral contraceptives for 10 years or more. We conclude that use of the pill is not associated with an increased risk of developing the clinical signs of diabetes mellitus.

- 1 Wynn V, Adams PW, Godsland I, *et al.* Comparison of effects of different combined oral-contraceptive formulations on carbohydrate and lipid metabolism. *Lancet* 1979;i:1045-9.
- 2 Duffy TJ, Ray R. Oral contraceptive use: prospective follow-up of women with suspected glucose intolerance. *Contraception* 1984;30:197-208.
- 3 Perlman JA, Russel-Briefel R, Ezzati T, Lieberknecht G. Oral glucose tolerance and the potency of contraceptive progestins. *J Chronic Dis* 1985;38:857-64.
- 4 Wingrave SJ, Kay CR, Vessey MP. Oral contraceptives and diabetes mellitus. *Br Med J* 1979;ii:23.
- 5 Royal College of General Practitioners. *Oral contraceptives and health*. London: Pitman Medical, 1974.

(Accepted 15 September 1989)

Methods of anaesthesia used for reduction of Colles' fractures

James B Hunter, Mark J L Scott, Simon A Harries

Orthopaedic Department,
Chase Farm Hospital,
Enfield EN2 8JL
James B Hunter, FRCSed,
registrar
Mark J L Scott, MB, senior
house officer
Simon A Harries, MB, senior
house officer

Correspondence to:
Mr Hunter.

Br Med J 1989;299:1316-7

The initial management of Colles' fracture has important medical and economic consequences, and the method of anaesthesia must be safe, efficient, and suitable to cope with large fluctuations in demand.¹ We present the results of a survey of the methods of anaesthesia used for reduction of Colles' fracture in the three regions covered by the confidential enquiry into perioperative deaths.²

Methods and results

All 54 accident departments with facilities for reduction of Colles' fractures were contacted by telephone to answer a questionnaire, and all responded. The table gives the methods of anaesthesia used and their frequency.

All general anaesthetics were given by anaesthetists, and all patients were starved for between four and six hours before anaesthesia. Bier's blocks were given by both anaesthetic (11 out of 18 centres) and accident and emergency or orthopaedic staff (seven out of 18 centres). In six of the seven hospitals where Bier's blocks were given by non-anaesthetic staff the patients were not starved before treatment.

Intravenous sedation was used only by non-

anaesthetic staff, and patients were not starved before its use. Automatic blood pressure cuffs and continuous electrocardiographs were universally available but used routinely during reduction in only 29 out of 54 centres. A cardiac arrest team was available in 52 out of 54 departments. The type and number of preoperative investigations ordered varied greatly.

No hospitals reported a change in their anaesthetic policy since the publication of the confidential enquiry into perioperative deaths, and only three important complications were reported anecdotally in the 12 months preceding the study. These were two cardiorespiratory arrests (in patients under general anaesthesia and intravenous sedation) and one Bier's block cuff failure, which passed uneventfully.

Comment

There was no significant interregional variation in anaesthetic practice. Patients who were given general

Distribution of methods of anaesthesia used in reduction of Colles' fractures in 54 accident departments covered by the confidential enquiry into perioperative deaths²

Method	No (%) departments
General anaesthetic	24* (44)
Bier's block	18 (33)
Intravenous diazepam	4 (7)
Intravenous diazepam with pentazocine	2 (4)
Intravenous diazepam with pethidine	1 (2)
Local anaesthetic haematoma block with or without inhaled 50% nitrous oxide and 50% oxygen	4 (7)
Intravenous pethidine with antiemetic	1 (2)

*Two were treated as inpatients.

anaesthetics were admitted as day patients in all but two centres, thus avoiding unnecessary expense to the hospital and disruption to the patient. In most cases these anaesthetics were given by junior anaesthetists.

Most non-anaesthetic staff did not starve their patients before giving Bier's blocks or intravenous sedation. Cardiorespiratory arrest is a recognised problem with both these techniques, and the outcome is adversely affected by aspiration; thus starvation is advisable. As monitoring equipment was universally available it would seem sensible to use it. Reduction of Colles' fractures under local haematoma block avoids many of the problems associated with anaesthesia, but the price is increased pain to the patient during reduction, which may not be acceptable.³

Despite our findings there were few important complications reported in the year preceding our study, and no hospitals had changed their method of anaesthesia in the light of the confidential enquiry into perioperative deaths. We therefore conclude that all of the above methods are safe and efficient but urge staff in accident departments to be vigilant over simple precautions to keep them so.

- 1 Ralis ZA. Epidemics of fractures during periods of snow and ice. *Br Med J* 1986;293:484.
- 2 Buck N, Devlin HB, Lunn JN. *Report of a confidential enquiry into perioperative deaths*. London: Nuffield Hospitals Trust, 1987.
- 3 Cobb AG, Houghton GR. Local anaesthetic infiltration versus Bier's block for Colles' fractures. *Br Med J* 1985;291:1683-4.

(Accepted 12 September 1989)

Spontaneous abortion rates after natural and assisted conception

Christopher Steer, Stuart Campbell, Melanie Davies, Bridgett Mason, William Collins

Bourne-Hallam Medical Centre, London W1N 5LR
Christopher Steer, MRCOG, research fellow
Melanie Davies, MRCOG, research fellow
Bridgett Mason, MRCS, medical director

Department of Obstetrics and Gynaecology, King's College School of Medicine and Dentistry, London SE5 8RX

Stuart Campbell, FRCOG, professor of obstetrics and gynaecology
William Collins, DSC, professor of reproductive biochemistry

Correspondence to: Dr Steer.

Br Med J 1989;299:1317-8

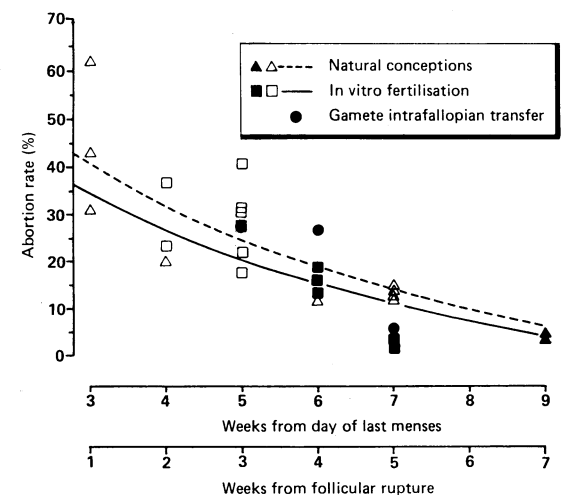
Many studies have determined the incidence of spontaneous abortion in women, and it has been suggested that the rate after assisted conception is higher than that during natural pregnancy.¹ Problems in interpreting results can, however, arise from the use of different reference points to estimate gestational age and from the availability of alternative and complementary methods for diagnosing an early pregnancy. We therefore determined the rate of spontaneous abortion among 430 women undergoing assisted conception and compared it with data from other series.

Methods and results

The 430 women became pregnant after in vitro fertilisation and embryo transfer at the Hallam Medical Centre from July 1984 to August 1987. The day of oocyte retrieval (follicular rupture) was used as the reference point for calculating gestational age at the time each test was applied. A serum concentration of human chorionic gonadotrophin of over 25 U/l, as determined by radioimmunoassay, was used as the index of early pregnancy 16 days after follicular rupture. Transabdominal ultrasonography was used to identify a gestational sac at 28 days' (4 weeks') gestation from follicular rupture and a fetal heart at 35 days' (5 weeks') gestation.

Twenty six (6%) pregnancies were shown to be ectopic by 28 days' gestation and were terminated. The remainder (404) were all diagnosed initially from raised serum human chorionic gonadotrophin concentrations. Overall 93 (23%) of these pregnancies ended in spontaneous abortion. Thirty four women were lost to the study at 28 days, but 370 underwent ultrasonography, which showed the presence of a gestational sac. Forty nine (13%) of these pregnancies ended in spontaneous abortion. Another 40 women were lost at 35 days, but 330 underwent a second ultrasonic scan, which showed the presence of a fetal heart. Twelve (3.6%) of these pregnancies ended in spontaneous abortion, which is similar to the rate of 3.7% reported after natural conceptions.²

We compared our data with those reported by others (17 references available from the authors) giving a total of 6710 conceptions (4604 natural, 1700 after in vitro



Relations between spontaneous abortion rate and gestational age at which diagnostic test was applied for natural and assisted conceptions. Closed symbols represent studies in which diagnosis was based on ultrasonography

fertilisation and embryo transfer, and 406 after gamete intrafallopian transfer). The spontaneous abortion rates for these three groups of women from each study are shown in the figure. The gestational ages were either related to the presumed time of ovulation (follicular rupture) or day 1 of the last menses. The relation between abortion rate, gestational age, and type of conception was derived from a model using analysis of covariance with weighting to allow for the different number of pregnancies in each study. An allowance was also made for the heterogeneity among studies. A linear relation was found between the abortion rate, p , expressed as $\log p/(1-p)$ and gestational age. The derived values for natural conceptions and those from in vitro fertilisation are shown. The effect of gestational age was highly significant ($p < 0.0001$). The test of parallelism was non-significant ($p = 0.4$), showing that there was no difference in abortion rates between the two groups at different stages of gestation. There were no significant differences between the abortion rates for natural conceptions and those from in vitro fertilisation or for natural conceptions and those from gamete intrafallopian transfer ($p = 0.20$ and 0.08 respectively). There was, however, a significant difference between in vitro fertilisation and gamete intrafallopian transfer ($p = 0.02$), which might be explained by the inclusion of 193 women aged over 40 among the 1071 in the series reported by Craft *et al*³ (spontaneous abortion rate 27.2%). The 95% confidence intervals for abortion rates at 5 weeks' gestation from follicular rupture (or 7 weeks' from last menses) were: natural conception 7.4% to 26.1%, in vitro fertilisation 6.2% to 20.0%, and gamete intrafallopian transfer 10.2% to 43.3%.