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Blood splashes: an underestimated hazard to surgeons

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Recent evidence confirms the widespread belief that hepatitis B virus may be transmitted through the conjunctiva (S Polakoff, personal communication), and there are theoretical grounds for thinking that HIV might also be acquired in this way. In Britain few surgeons' routinely use eye protection while operating, but in hospitals in the United States protecting the eyes is becoming the norm in centres where the prevalence of HIV carriage is high.[1] It is not known how often surgeons' eyes are splashed with body fluids. We attempted to assess the risk of infection by this route by counting the number of splashes of blood on our spectacle lenses at the end of each of a consecutive series of operations.

Methods and results

Both of us always wear spectacles when operating. Over three months we recorded the number of splashes of blood on our glasses after each operation and then cleaned the lenses carefully before the next operation. The nature and duration of each operation were recorded. Data were collected from a consecutive series of 257 operations.

Overall, we found at least one splash of blood after 64 operations (25%), the number of splashes ranging from one to 40, median four. More than 10 splashes were present on eight occasions. There was a mean of 1·3 splashes per operation or 5·0 per case in which contamination occurred. We were aware of the contamination during the operation on only three occasions. The incidence of contamination varied with the type of operation and its duration (table). The mean number of splashes acquired per hour of operating in cases taking up to 30 minutes was half that in cases taking two hours or more (0·94 *v* 1·9). The incidence of contamination was slightly higher for one surgeon than for the other (28% *v* 22%), owing to a higher proportion of long or complex operations.

Incidence of blood splashes on spectacles during operations

Operations	No performed	Spectacles splashed
Type:		
Arterial	25	11
Gastrointestinal	40	24
Other	192	29
Duration:		
< 30 min	151	11
30-120 min	77	35
> 120 min	29	18

Comment

In general surgery fine drops of blood bombard the area around the surgeon's eyes during a quarter of operations. Both the incidence and the rate of contamination are higher in complex and long operations, but contamination can occur during minor procedures. We do not think that we are unusually messy surgeons, and the fact that we both had similar rates of contamination suggests that the results may be typical of general surgery and perhaps of all types of surgery. Most of the blood splashes were minute, and we were unaware of them in all but three cases. Such splashes are unlikely to trigger a reflex blink when hitting the eye, which is unlikely anyway to prevent infection occurring.

The surface area of spectacle lenses is substantially larger than that of the palpebral fissure, and only a proportion of the splashes that were picked up on the lenses would otherwise have entered the eye. Nevertheless, the incidence of deposits of blood was high. Each surgeon must decide on the basis of the available data whether the risk of infection is sufficient to justify wearing eye protection while operating. As the number of HIV carriers in England and Wales is estimated to be 36 000 – 148 000[2] we think that eye protection should become routine. Unfortunately, conventional spectacles provide only partial protection: several of the blood splashes were on the inner surfaces of our lenses.

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Oral contraceptives and diabetes mellitus

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Although it has been shown that in some women glucose tolerance deteriorates when they use oral contraceptives,[1-3] there is uncertainty about the clinical importance of these changes. In particular, do they predispose users of the contraceptive pill to an increased risk of clinical diabetes mellitus? An earlier report suggested that pill users were not at risk.[4] It has been argued, however, that an increased risk may become apparent only after prolonged observations of women who have used the pill for long periods of time.[3] We present the latest findings from the Royal College of General Practitioners' oral contraception study, using data available at May 1989.

Patients, methods, results

Over a 14 month period starting in May 1968, 1400 general practitioners throughout the United Kingdom recruited 23 000 women who were using the contraceptive pill and 23 000 who had never used it. At six month intervals thereafter the doctors recorded for each woman still under observation details of any oral contraceptives prescribed and all reported episodes of morbidity. These analyses are based on all cases of

Standardised rates of diabetes mellitus (ICD code 250) in non-users and current and former users of oral contraceptives

	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.

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Methods of anaesthesia used for reduction of Colles' fractures

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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 deaths[2]

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.