The impact of the fee-for-service reimbursement system on the utilisation of health services

Part III. A comparison of caesarean section rates in white nulliparous women in the private and public sectors

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Summary

The caesarean section (CS) rate among white women aged 20 - 35 years and having their first baby was examined, comparing the private fee-for-service medical aid sector with Johannesburg Hospital. The chance of having a CS in the private sector was 50% greater than in the public sector (28,7% v. 19,5%). Twice as many CSs were done on weekdays as over weekends, and it is argued that only a quarter of these are accounted for by elective procedures (planned before labour begins). We also found that in the private sector the daily frequency of non-caesarean deliveries was 56% higher during the week than on Saturdays or Sundays. Considering non-caesarean deliveries separately, it is inferred that the rate of induction of such deliveries was 28,7% in the private sector compared with 2,8% in Johannesburg Hospital.

The evidence strongly confirms the international experience that the CS rate in a given population is not objectively determined by medical factors and is strongly influenced by individual doctors' decisions. Moreover, fee-for-service reimbursement of doctors leads to increased intervention in delivery, in the form of more frequent induction of labour and more CSs.

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Caesearean section (CS) may be more amenable to doctor-induced demand than many other surgical procedures. While there are certain definite indications for the procedure, there are large grey areas within which different doctors would make different decisions in the same situation. It is also a procedure that has become relatively safe in recent years. For these reasons, the impact of fee-for-service payment could be to encourage doctors to perform this procedure more often than would be the case with a riskier procedure for which there were more objective indications. Similar arguments apply to the decision to intervene by inducing labour. This study

attempts to investigate the effects of different methods of reimbursement of practitioners on CS rates. The data collected also allowed us to look at rates of induction of labour under the different forms of payment.

Methods

This study is a retrospective analysis of CS rates among white women aged 20 - 35 years, delivering for the first time. Data were collected from the records of 637 women who delivered in Johannesburg Hospital under the care of salaried midwives and doctors, and 620 women belonging to three medical aid schemes, most of whom delivered under the care of fee-for-service practitioners. Cases were selected by taking all consecutive deliveries meeting the selection criteria of parity, age and race, beginning in July 1989 and working backwards until the required sample size was obtained.

The age, parity and race selection criteria were applied in order to control for confounding factors, since these may occur with different frequencies in the two populations being compared.

Results

Table I shows the CS rates in each group of women. A woman delivering in the private fee-for-service sector was 50% more likely to have a CS than one delivering at Johannesburg Hospital.

In trying to find a possible explanation for this difference, we analysed the number of deliveries and CSs by day of the week. To the extent that CSs are determined by objective medical reasons rather than subjective reasons of finance and convenience, one would expect to find roughly the same number of CSs done on each day of the week. However, elective caesarean deliveries and elective inductions for medical reasons would be planned for weekdays and so there would always be a slight excess of deliveries and CSs during the week. The results of this analysis are shown in Table II.

TABLE I. CS RATES IN 20 - 35-YEAR-OLD PATIENTS

	Johannesburg Hospital	Medical aids
Total deliveries	**637**	**620**
CSs	**124**	**178**
CS rate (%)	**19,5**	**28,7**
95% CI of CS rates	**16,4 - 22,5**	**25,1 - 32,3**
95% CI of difference between rates	**4,5 - 13,9%**	**$P < 0,001$**

CI = confidence interval.

The number of deliveries and the number of CSs per weekday were 67% and 97% higher than the number per weekend day in the medical aid sector. Both differences are highly significant ($P < 0,001$). By contrast, the excess weekday deliveries and CSs at Johannesburg Hospital are 7% and 25% respectively. However, the weekday/weekend differences are not statistically significant for either deliveries or CSs in the Johannesburg Hospital figures. While it is possible that there is no real day bias at the Johannesburg Hospital, it is more likely that there is a small difference requiring a larger sample to achieve statistical significance.

Discussion

Comparability of patient groups and treatment settings

The problem when comparing CS rates is the substantial differences in risk encountered in different age groups and income categories, and in groups with different obstetric histories. As mentioned above, we controlled for age and obstetric history by looking only at nulliparous women in the 20 - 35-year age group.

The mean age for the Johannesburg Hospital patients was 23,29 years. The data for the medical aid patients did not allow us to calculate mean age, and it is likely that it is slightly higher than that for the Johannesburg Hospital patients. Published data show that the CS rate increases with age; however, this is largely accounted for by the higher rates of repeat procedures among older women.[1] Within the age range 20 - 35 years, controlling for parity, the variation is small.[2,3] Furthermore, an analysis of the CS rate among women aged above 35 years and belonging to a medical aid scheme indicates that it was not different from that in the 20 - 35-year age group. Thus, even if the mean age of medical aid patients was higher than that for patients at Johannesburg Hospital, this is unlikely to have created a significant bias.

Our comparisons for income category show, as expected, that more patients at Johannesburg Hospital than patients on medical aid schemes are from lower income categories. The proportion of the sample who had a monthly income below R1 000 was 4% for medical aid patients and 24% for Johannesburg Hospital patients. The higher proportion of patients with lower incomes at Johannesburg Hospital would be expected to produce an upward bias in the CS rate in this group, since patients from lower socio-economic groups are generally thought to represent greater obstetric risks. If the difference in the socio-economic profile of the two groups of patients does have any effect, it is therefore likely to lead to an *underestimate* of the difference between the CS rates.

Controlling for quality of care is very difficult. It may be claimed that the problem is not too many CSs in the private sector, but rather too few in the public sector. In other words, the quality of care is claimed to be superior in the private

TABLE II. CSs BY WEEKDAY AND WEEKEND DAY

	Johannesburg Hospital			Medical aids		
	Weekdays	Weekends	Ratio WD/WE	Weekdays	Weekends	Ratio WD/WE
Deliveries, average No./d	**92,8**	**86,5[1]**	**1,07**	**100,0**	**60,0[2]**	**1,67**
CSs average No./d	**18,8**	**15,0[3]**	**1,25**	**29,6**	**15,0[4]**	**1,97**
CS rate (%)	**20,26**	**17,34**	**1,17**	**29,6**	**25,0**	**1,18**
Non-CS deliveries	**74,0**	**71,0[5]**	**1,04**	**70,4**	**45,0[6]**	**1,56**

1. $N = 637$, no significant difference.
2. $N = 620$, difference highly significant ($P < 0,001$).
3. $N = 124$, no significant difference.
4. $N = 178$, difference highly significant ($P < 0,001$).
5. $N = 513$, no significant difference.
6. $N = 442$, difference highly significant ($P < 0,001$).

sector and this explains the different rates. The only direct way of assessing this would be by measuring perinatal and maternal outcome, for which very large samples are required, given the small differences expected. However, the indirect evidence for at least equal quality care is convincing. In the first place, as the primary obstetric teaching unit in Johannesburg it is reasonable to assume a good quality of medical care at Johannesburg Hospital. Secondly, many studies have now shown that it is possible to achieve equally good perinatal and maternal outcome with very low CS rates — even below 10%.[4-6]

Furthermore, variations at a national level between countries and centres assumed to provide, on average, good obstetric care, indicate that there is no simple relationship between CS rates and quality of care. Caesarean birth rates for Norway (1981),[7] the USA (1986),[8] Australia (1981)[9] and New Zealand (1983/4)[10] were 9,4%, 24,1%, 16,2% and 9,6% respectively.

Finally, Johannesburg Hospital is a referral centre for the region and could be expected to have an excess of high-risk patients, often transferred while in labour, although many may be transferred in the antenatal period. In the sample studied, 5 transfers in labour were recorded, of which 4 resulted in CS. We have left all these cases in the study sample, which would again be expected to produce an upward bias in the CS rate at Johannesburg Hospital relative to other hospitals.

Interpretation of the differences in rates

We have thus attempted to control for the relevant confounding variables that affect the medical indications for CS, and to the extent that these are not controlled for, they should increase the CS rate at Johannesburg Hospital. We believe, therefore, that the 50% higher CS rates in the fee-for-service private sector are unlikely to be due to objective medical reasons.

The one medical indication for CS that may be more common in the private fee-for-service sector is 'failed induction of labour', if inductions themselves are more common. The evidence suggests that this is indeed the case. There are 56% more non-CS deliveries per day during the week than on weekends. This compares with a possible excess of only 4% in Johannesburg Hospital (Table II). The likely explanation for this is that doctors in the fee-for-service private health sector utilise induction of labour more frequently than do their public sector counterparts, and that they schedule these inductions during the week. Based only on the non-CS deliveries we have calculated that the proportion of non-CS deliveries that were induced in the private sector was 28,7%, while the proportion in Johannesburg Hospital was 2,9%. Given that a number of inductions will fail and end in CS, the calculation based only on non-CS deliveries underestimates the rate of induction, especially in the private sector with its higher CS rate.

If we make the conservative assumption that the rate of medically determined elective inductions is the same in Johannesburg Hospital as in the private sector, and that these are always done during the week, we can subtract the Johannesburg Hospital rates from the private sector rates to give a conservative estimate of the percentage of labours that will be induced for reasons that are unlikely to be medical. This suggests that about 26% of white women delivering their first baby in the private sector were induced who would not have been induced had they delivered at Johannesburg Hospital.

We have suggested above that elective CSs are booked for weekdays, and that this would explain some of the difference between rates on weekends and weekdays. This does not, however, explain why caesarean deliveries are 97% more fequent on weekdays in the private sector and only 25% more frequent in Johannesburg Hospital since, if only elective CSs are scheduled during the week, there are no reasons why the weekday excess should be higher in the private sector than in the public sector. In fact, since Johannesburg Hospital is a referral centre for more complex cases, precisely the opposite should be the case. The major factor in the explanation must relate to the high number of inductions done during the week, which, if not successful, end in caesarean delivery.

The above provides evidence that doctors have the ability to induce the demand for their services, and that in the fee-for-service, third-party payment system they respond by increasing the rate of obstetric interventions. These results are also consistent with the experience in other countries of the effect of payment systems on CS rates.

In Brazil, for example, doctors receive the highest fees from private patients, lower fees from social security patients, and the lowest payments for indigent patients. According to one 1981 study, the CS rate in nulliparous women was 75% in private patients, 40% in social security patients and below 25% in indigent patients.[11] Other Brazilian studies have found similar results.[12,13] A study from the USA comparing CS rates in low-risk, nulliparous women attending private physicians and clinics found rates of 13,2% and 10,7% respectively.[3] Similar evidence is reported from Christchurch (New Zealand)[14] and Australia.[9] Other studies have also found time biases in private physician deliveries compared with salaried staff.[15]

Conclusion

The rates of CSs and inductions are much higher in the private medical aid sector than in a central academic hospital, with no apparent medical explanation. This raises two different concerns. Firstly, from the perspective of optimal quality maternal care, CSs and inductions have their own complications and should not be undertaken without sound medical indications. Secondly, a caesarean delivery consumes far more resources than a vaginal delivery, in terms of skilled personnel time, theatre time, drugs, days in hospital (CS 5 - 7 days; vaginal delivery 3 - 5 days), nursing care, and of course, finances. In the context of the pressing need to ensure a rational allocation of scarce medical resources, mechanisms must be found to limit supplier-induced excess utilisation. Local and international evidence suggests that the place to start is by regulating, if not eliminating, fee-for-service care.

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