

MEDICAL PRACTICE

*Outside Europe***Obstetric care in the central Canadian Arctic**

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British Medical Journal, 1978, 2, 1001-1004**Summary and conclusions**

All pregnancies that occurred during 1971-5 among 4000 Canadian Eskimos living in isolated settlements in a district of the North-west Territories were reviewed. Obstetric care was provided in settlement nursing stations, at a base hospital manned by general practitioners, and at a teaching hospital in Winnipeg. Of the 622 infants delivered in 1971-5 218 were delivered in nursing stations by midwives, 338 in the base hospital, and 54 in the teaching hospital. Caesarean sections were performed in 10 cases, and the perinatal mortality was 25.7 per 1000 births.

Though it is hard to defend patients delivering their babies in remote areas with no medical help, the results seemed to be acceptable. The credit for this goes to experienced midwives, a liberal evacuation policy, close co-operation from general practitioners, and the specialist visiting and consulting service.

Introduction

Providing maternity services to the vast, sparsely populated, and remote areas of northern Canada poses considerable practical difficulties. The responsibility for medical care to this area lies largely with the Medical Services Branch of the Department of National Health and Welfare. To administer health care to the

North-west Territories the area is divided into four zones. The provision of obstetric care during 1971-5 to one of these zones—the Keewatin district—is described here.

Services in Keewatin

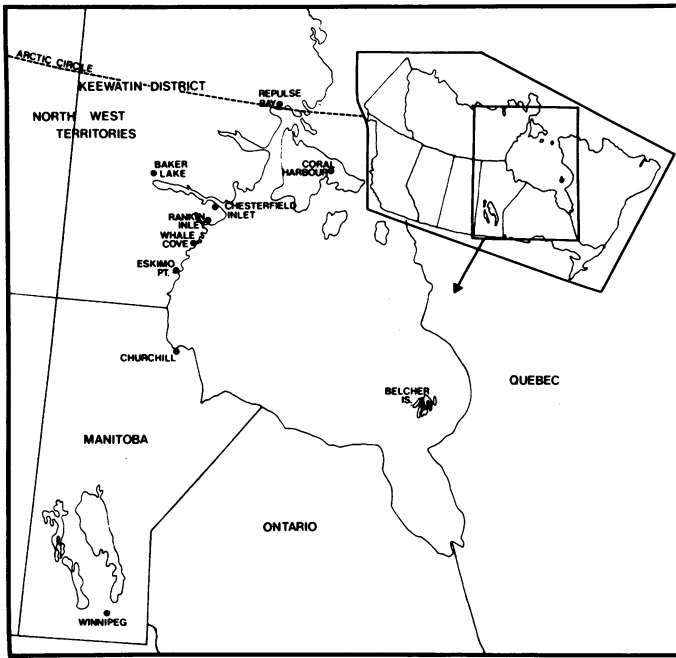
The Keewatin district is located in the central Canadian Arctic (see figure) and covers some 225 000 square miles. The population of about 4000 Canadian Eskimos (Inuit) and 350 Caucasians lives in eight widely separated settlements varying in population size from 200 to 1000. Churchill is 600 miles from Winnipeg by air, and the most northerly settlement (Repulse Bay on the Arctic Circle) is 600 miles north of Churchill. Flying time from Churchill to Winnipeg is one and a half to four hours, and flying time between settlements and Churchill varies from one to eight hours. There is a daily scheduled air service from Churchill to Winnipeg. Scheduled flights from Churchill to the settlements vary in frequency from daily to weekly. There are no roads.

Medical care in the settlements is provided in nursing stations staffed by one to three nurse practitioners, at least one of whom is an experienced midwife. They provide antenatal care for all pregnancies and also carry out the deliveries of low-risk cases in the settlement nursing station. Other patients are referred for delivery to the base hospital in Churchill, Manitoba. The Churchill Health Centre (formerly the Fort Churchill General Hospital) is a 30-bed hospital staffed by general practitioners, who provide the continuing antenatal care and delivery for moderate-risk cases referred from Keewatin as well as all obstetric care for low- and moderate-risk cases from the local population. These general practitioners also visit the Keewatin settlements every four to six weeks to provide support for the nurse practitioner; this support includes assessing the risk of complications during pregnancy. During the study 120-150 women a year had their babies delivered by general practitioners at the Churchill Health Centre.

Three obstetric consultants from the Women's Centre teaching hospital in Winnipeg share monthly visits in rotation to Churchill, where they see patients and advise on the management of high-risk cases. The consultants are also available by telephone for consultation, and they manage high-risk cases referred to them in Winnipeg. The general practitioners and consultants are all employed by the Northern

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Keewatin district in relation to Churchill and Winnipeg.

Medical Unit of the Faculty of Medicine in the University of Manitoba. The health needs and the administration of health services to the Keewatin district have been outlined before.^{1 2}

Patients and methods

The records of all Inuit patients from the Keewatin district who delivered during 1971-5 were reviewed. About 50 Caucasian Keewatin residents who delivered during this time were excluded from this review. The obstetric outcome and patterns of referral and evacuation were noted. Each pregnancy was scored retrospectively on the University of Manitoba antepartum high-risk pregnancy scoring form.³ The χ^2 test of independence was used to test statistical significance.

Results

Apart from twins, 622 babies were born to 401 mothers during 1971-5. Four mothers had four children, 46 had three, 117 had two, and the remaining 234 had one. Though they were not included in the overall figures in this review, four sets of twins were also born: an incidence of 1 per 157 deliveries. There were no perinatal deaths among the twins. On the other hand there is evidence that the infant and child mortality and morbidity of twins among the Inuit of this area is high (C A Ferguson, personal communication). The average number of deliveries each year was 124 (range 118 to 131). The

distribution of patients according to their settlement and place of delivery is shown in table I. The 12 (2%) women who were confined in places other than the settlement nursing station, Churchill, or Winnipeg had their babies delivered on the land, at home, in aircraft, or in the transient centre. The mean age of patients at delivery was 26.5 years (range 13-48 years). Thirteen women were aged under 16 years and 92 were older than 35 years. The parity ranged from 0 to 16. Primigravidae accounted for 123 births, para 1-4 for 278, and grand multiparae (para ≥ 5) for 221. Antenatal and past obstetric complications are shown in table II.

TABLE II—Antenatal and past obstetric complications

Complication	No (%) of cases
Obstetric history:	
Previous stillbirth	33 (5.3)
Previous neonatal death (0-28 days)	76 (12.2)
Previous postnatal death (29-365 days)	139 (22.3)
Present pregnancy:	
Uncertain dates	303 (48.7)
Anaemia (<10 g/dl)	61 (9.8)
Hypertensive disease (including pre-eclampsia)	50 (8.0)
Antepartum haemorrhage:	
Abruptio placentae	8 (1.3)
Placenta praevia	0
Unclassified	21 (3.4)
Breech (in labour)	9 (1.4)
Unstable lie (>37 weeks or in labour)	11 (1.8)
No antenatal care	9 (1.4)
Minimal antenatal care (<4 visits)	17 (2.7)

Evacuation patterns—The numbers of women evacuated from their settlements for delivery are shown in table III. Elective evacuations occurred in women who were routinely evacuated from the settlement to Churchill to await delivery in the final two to four weeks of pregnancy but had no other special complications. All the other evacuations were emergencies, but had varying degrees of urgency. The discrepancy between the number of patients evacuated to Churchill and Winnipeg and the numbers who delivered there was accounted for by the fact that some patients delivered in the plane or in the transient centre in Churchill, and some referred as emergencies in early pregnancy then returned to the settlement and either delivered there or were later evacuated electively. All the evacuations made in the neonatal period were emergencies and half required chartered aircraft. Of the emergency evacuations from Keewatin to Churchill because of risk to the mother, two-thirds were made by scheduled flights. Only 5 of the 58 mothers evacuated from Churchill to Winnipeg required chartered aircraft. The causes of the 94 emergency maternal evacuations from Keewatin to Churchill included premature

TABLE III—Maternal and neonatal evacuations

	No (%) of evacuations	
	Maternal	Neonatal (emergency)
Keewatin to Churchill	319 (51.3) (elective) 94 (15.1) (emergency)	11 (1.8)
Keewatin to Winnipeg	8 (1.3) (emergency)	2 (0.3)
Churchill to Winnipeg	58 (9.3) (emergency)	5 (0.8)

TABLE I—Distribution of patients according to settlement and place of delivery

Settlement	No (%) of deliveries	Place of delivery											
		Nursing station			Churchill			Winnipeg			Other		
		No of births	% Of all Keewatin births	% Of settlement births	No of births	% Of Keewatin births	% Of settlement births	No of births	% Of Keewatin births	% Of settlement births	No of births	% Of Keewatin births	% Of settlement births
Eskimo Point	148 (23.8)	62	10	41.9	69	11.0	46.6	11	1.8	7.4	6	0.9	4.1
Baker Lake	116 (18.6)	42	6.7	36.2	60	9.6	51.7	13	2.1	11.2	1	0.2	0.9
Rankin Inlet	105 (16.9)	31	5.0	29.5	62	10.0	59.1	11	1.8	10.5	1	0.2	0.9
Repulse Bay	71 (11.4)	14	2.3	19.7	51	8.2	71.8	6	0.9	8.5	0		
Coral Harbour	61 (9.8)	20	3.2	32.8	33	5.3	54.1	7	1.1	11.5	1	0.2	1.6
Chesterfield Inlet	54 (8.7)	21	3.4	38.9	32	5.2	59.3	1	0.2	1.9	0		
Belcher Islands	39 (6.3)	18	2.9	46.2	18	2.9	46.2	2	0.3	5.1	1	0.2	2.6
Whale Cove	28 (4.5)	10	1.6	35.7	13	2.1	46.4	3	0.5	10.7	2	0.3	7.2
Total	622 (100)	218	35		338	54.3		54	8.7		12	2.0	

rupture of the membranes and threatened or true premature labour (35), third-stage accidents (20), antepartum haemorrhage (15), and hypertensive disorders (10). Fifty-eight women were moved from Churchill to Winnipeg because of hypertensive disorders (10), antepartum haemorrhage (10), premature rupture of the membranes or premature labour (8), or malpresentations (8) or because they were elderly (>35 years) or young (<16 years) primigravidae (7), or for other reasons (15).

Consultations—Specialist consultations either in the Keewatin settlements or in Churchill were undertaken in 72 cases. In an additional 63 cases telephone consultation was sought with the obstetrician in Winnipeg. (This is probably a low figure as not all telephone consultations were documented on the charts.)

High-risk pregnancy selection—In our study of the application of antepartum high-risk pregnancy scoring to the obstetric population of the Winnipeg teaching hospitals in 1974-5, we identified three groups.³ The low-risk group (67%) scored 0-2 and had a perinatal mortality of 4.8/1000 births, the high-risk group (28%) scored 3-6 with a perinatal mortality of 41.0/1000, and an extreme-risk group (5%) scored ≥7 with a perinatal loss of 112/1000. Using these scoring criteria on the Keewatin population showed that they generally had higher risks: 51.4% were low-risk patients, 35% high-risk, and 13.6% extreme-risk.

Caesarean section—Ten (1.6%) patients were delivered by caesarean section. The indications were: cephalopelvic disproportion (4), elderly primigravida with failed induction (2), elective repeat (2), cord prolapse (1), and transverse lie (1). All of the caesarean sections were done in Winnipeg and represented 10 of the 54 Keewatin deliveries done in the Women's Centre. Only two of the 10 patients had to be evacuated to Winnipeg in labour, the remaining eight having been evacuated for antenatal complications.

Postpartum complications—Primary postpartum haemorrhage occurred in 63 (10.1%) women, retained placenta in 28 (4.5%), and manual removal of placenta in 18 (2.9%). One-third of the cases of retained placenta were not associated with postpartum haemorrhage, giving an incidence of 11.6% (72) for all third-stage accidents. Twenty-three (32%) of the women with third-stage accidents needed blood transfusion. Postpartum tubal ligation was carried out in 32 cases. This is a deceptively small number as, for logistical reasons, most patients had interval tubal ligations. The sterilisation practice for this group of patients has already been reviewed.⁴

Mortality rates—The maternal, perinatal, and infant mortality rates^{5,6} for Canada, Keewatin Inuit, and all Inuit of the North-west Territories in 1971-5 are shown in table IV. Although the perinatal mortality rate was lower in the Keewatin Inuit than in all of the Inuit in the North-west Territories this difference was not statistically significant. There were 16 perinatal deaths among 622 babies born, giving a perinatal mortality rate of 25.7 per 1000 total births. These are shown in relation to the place of delivery in table V. Prematurity

was the main cause of death, half of the infants who died weighing less than 1500 g and three-quarters less than 2500 g. There were considered to be avoidable medical or nursing factors in two of the 16 deaths. In a further four cases of premature labour with ensuing neonatal death it was thought that the babies might have survived if they had been born in a large hospital with a neonatal intensive care unit.

Discussion

Both the birth rate and the perinatal mortality rate of the Canadian Inuit are double the national average, while the infant mortality rate is four times as high as in the rest of Canada. The perinatal mortality in this survey was higher than the Canadian average but lower than that for all Inuit of the North-west Territories. There were 16 perinatal deaths (25.7/1000), whereas we might have expected 20 (32.2/1000).³ Thus, given the high-risk nature of the population and the logistics involved, the perinatal mortality rate obtained during the period of this survey seems acceptable. Table V shows that the perinatal mortality rate was highest in those patients delivered in the nursing station. This is a biased figure as most of these deaths were due to unpredictable premature labour. All but two infants weighed less than 2000 g and one of these had a congenital anomaly incompatible with life.

The caesarean section rate (1.6%) was very low and compared with a mean rate of 6.9% for the province of Manitoba⁷ and 10.5% for the Winnipeg teaching hospitals during the same period. With liberal specialist consultation and good air service between Churchill and Winnipeg the need for caesarean section in Churchill was averted. Since the medical staff in Churchill are general practitioners and have limited surgical experience they are prepared to do caesarean sections only for extreme indications. Obviously with such a low section rate in a high-risk population there is concern about high perinatal morbidity. Although this study did not extend to that area (other than to record that 86.7% of one-minute Apgar scores were 7 or above), there was no evidence that the early neonatal morbidity was high. Inuit patients tend to have very efficient uterine action, endure labour well, and rarely have dystocia. This is borne out by the low forceps-ventouse rate of delivery (27 (4.4%) cases). Another possible factor in the low section rate is that induction of labour was undertaken in only 50 cases.

Providing obstetric care to small numbers of people scattered over a vast area presents a considerable challenge. The only practical way of providing primary care to isolated communities of a few hundred people is with nurse practitioners. Even then there are difficulties with a high annual turnover rate (52%) of nurses⁸ and in maintaining practical skills when even the busiest nursing station averages only about one delivery per month.

If patients are to continue to be delivered in isolated settlements without immediate medical back-up then cases must be selected carefully and high-risk cases evacuated. At present, the policy is very simple: all primigravidae, grand multiparae, and any patient with a significant obstetric history or antenatal complication are electively evacuated for delivery in hospital. I have some misgivings about the practical application of an antepartum high-risk scoring form in these areas. Such a form may well have a beneficial role but is mainly an aid to the systematic and disciplined review of each patient and as an educational tool, rather than an absolute score dictating the management of the patient. Notwithstanding this limitation, the high-risk scores in this review correlated significantly (P<0.01) with the need for all types of maternal evacuation, induction of labour, mode of delivery, and the need for specialist consultation.

The acute emergency evacuation of patients usually adds extra risks to all concerned and should be avoided if at all possible. The expense to the health service is also considerable. Chartering an aircraft from Churchill to Winnipeg costs about \$4000 and the cost of chartering an aircraft to fly from a settlement to Churchill varies from \$1000 to \$4000. In an attempt to

TABLE IV—Mortality rates among all Canadians, Inuit of North-west Territories, and Inuit of Keewatin, 1971-5

	Canada	North-west Territories Inuit	Keewatin Inuit
Maternal mortality (per 10 000 live births)	1.2	13.2	0
Stillbirths (SB) (after 27 weeks; per 1000 live births)	8.3	16.8	8.0
Neonatal mortality (NND) (0-28 days; per 1000 live births)	11.0	27.6	17.7
Perinatal mortality (SB + NND per 1000 total births)	19.3	44.4	25.7
Postneonatal mortality (29-365 days; per 1000 live births)	5.0	41.4	38.5
Infant mortality (0-365 days; per 1000 live births)	15.9	69.0	56.2

TABLE V—Perinatal mortality and place of delivery

	All cases (n = 622)	Place of delivery		
		Nursing station (n = 218)	Churchill (n = 338)	Winnipeg (n = 54)
No of stillbirths (≥500 g)	5	1	3	1
No of neonatal deaths (0-28 days)	11	9	2	0
Perinatal mortality (per 1000 total births)	25.7	45.8	14.8	18.5

cut down emergency evacuations from Churchill to Winnipeg, liberal phone consultation is encouraged. If possible when induction of labour is undertaken in Churchill it is planned about 12 hours before the next scheduled flight, so that if evacuation is required for failed induction a charter will not be necessary.

The principle of electively evacuating any patients with any past or present complications in pregnancy is closely followed. This in itself also causes problems, with patients having to leave home at 36 to 37 weeks' gestation and spend the rest of their pregnancy in the transient boarding centre in Churchill. This disrupts the family and the patient is usually lonely during the stay away from home. During this study women electively evacuated spent an average of 21.7 days (1-64 days) in Churchill before delivery. Including the postpartum stay and transportation, the average time away from home was about four to five weeks. One major factor influencing this time interval is those patients who are uncertain of their dates (303 (48.7%) of this group). Those who were unsure of dates were significantly less likely to spend fewer than three weeks away from home before delivery (43.5%) than those who were sure of dates (63%). Only 26 patients had minimal or no antenatal care and most attended the nursing station early on in their pregnancy. There is therefore both opportunity and a considerable onus on the nurse to try to pinpoint gestational age as accurately as possible by taking a history and by assessing uterine size bimanually.

In the context of modern obstetrics in the Western world it is difficult to defend patients delivering their babies in isolated areas without medical help or hospital facilities. In the present social and cultural context of the Canadian Inuit, however, this still seems to be desirable. The maternal and perinatal results of this five-year survey seem to support this. Indeed, comparing the perinatal and infant mortality figures shows that it is safer to be born in the settlement than to remain there for the first year

of life. These results are due to experienced midwives (to whom the main credit must go), a liberal evacuation policy, close general practitioner involvement, and a specialist visiting and consulting service. Any reduction in the level of these services would be potentially disastrous, with the third stage of labour being the main threat to maternal life.

There are signs that the social and medical expectations of the Canadian Eskimos are changing, and many of the younger patients request and expect hospital delivery. This will probably be the main factor influencing the obstetric services to this area in the future.

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Personal Therapeutics

Treatment of migraine

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Migraine has a certain social respectability and is a convenient diagnosis for both doctor and patient. It is therefore often misdiagnosed, though occasionally it may be difficult to determine where migraine ends and tension headaches start—and often both occur in the same patient. Unfortunately there is no satisfactory definition for migraine, but I have found the following helpful—recurrent headaches with two or more of the following five factors: unilateral headache; nausea; visual or other neurological disturbance; family history of migraine;

and history of bilious attacks, travel sickness, asthma, eczema, or hayfever.

Migraine has a wide range: some patients have only mild attacks and can continue to work, whereas others are totally incapacitated, so treatment must be tailored to the individual. Any precipitating factor (see table) should be identified from the history and if possible corrected; treatment may then be divided into managing the acute attack and prophylaxis.

Acute attack

Most patients with mild attacks are helped by aspirin or paracetamol with an antiemetic, metoclopramide (Maxolon) 10 mg, if nausea is a troublesome complication. For the more severe attack ergotamine remains the most effective treatment, though to my knowledge it has never been shown to be more effective than a placebo in a double-blind trial. Because nausea and vomiting are common side effects the aim is to give the

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