Pregnancy following poliomyelitis

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Summary

A review of forty-nine pregnancies in thirty-seven patients who had previously suffered from poliomyelitis found that obstetric complications were proportional to the clinical disabilities of the patient. A simple test of unilateral weight-bearing gives a good clue as to whether pelvic asymmetry is present.

FORTUNATELY it is over 20 years since Hunter and Millikan (1954) were able to collect 610 cases of acute poliomyelitis during pregnancy from the literature, and add forty-nine cases of their own. In spite of present immunization programmes, poliomyelitis remains with us in the Western world. The obstetrician is less likely to be faced with the acute case, but is more likely to be faced with the various sequelae of the disease.

Here are reported forty-nine pregnancies in thirty-seven patients who had suffered previously from poliomyelitis.

Incidence

The cases were delivered in the Dundee General Hospitals in the 10 years 1966-1975. Table 1 is taken from the reports of the Medical Officer of Health for Dundee for the years 1948-1962 inclusive, and shows the total of cases of poliomyelitis and also the number of cases of poliomyelitis notified in females of under 25 years of age. All forty-nine patients were born in the area covered by the report during the years detailed. Thirty-seven normal births from the ninety-three women does not allow an accurate incidence rate to be estimated as the ninety-three patients were not all followed-up. These figures, however, add weight to the argument that all children should be vaccinated early in life.

Age and parity

Taking the patients' most recent pregnancy the age variation and parity variation are shown in Tables 2 and 3 respectively. Table 2 also shows the age at which the patient suffered poliomyelitis.

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TABLE 1. Notified cases of acute poliomyelitis, Dundee 1948-1962

Year	Total patients	Females under age 25
1948	11	3
1949	7	3
1950	94	31
1951	16	10
1952	5	2
1953	6	3
1954	12	7
1955	13	5
1956	3	2
1957	5	1
1958	20	8
1959	1	0
1960	0	0
1961	3	1
1962	46	17
Total	242	93

Sequelae of poliomyelitis

It was possible to divide the patients into three groups as regards sequelae. *Group one* had minimal sequelae. Most of the patients in this group had 'drop foot' (Fig. 1) and although there was often pelvic tilt to compensate for any slight difference in leg length there was full movement at both knee and hip joints. Unilateral weight-bearing was possible in all cases.

Group two patients had suffered moderate sequelae. All had suffered wasting and shortening of one lower limb with consequential tilting of the pelvis. Three of this group required a caliper for walking, the remaining patient who had had muscle transplant surgery managed with a supporting bandage. All patients in this group had kyphoscoliosis (Fig. 2).

Group three patients, as expected suffered severe sequelae. Of the two in the series both were paralysed below the waist, one, however, achieved mobility wearing two calipers, even though both of her legs were wasted and there was some pelvic tilt as one leg was shorter than the other. The other patient in this group was confined to a wheel-chair, both of her legs being shortened, wasted and deformed.

TABLE 2. Age at latest confinement related to age at illness

Mother's age (years)	No. of cases	Group one Age when affected (years)		No. of cases	Group two Age when affected (years)		No. of cases	Group three Age when affected (years)	
		< 1	1-5		< 1	1-5		< 1	1-5
< 19 years	3	—	3	1	—	1	—	—	—
20-24	17	2	15	2	—	2	1	1	—
25-29	11	3	8	1	—	1	1	—	1

Table 3. Age and parity

Mother's age (years)	Pregnancy no.		
	1	2	3
< 19	4	—	—
20-24	13	6	1
25-29	9	4	—

FIG. 1. Patient from Group one with slight 'drop foot', pelvic tilt and wasting (slight) of right leg.

FIG. 2. Group two patient with kyphoscoliosis, wasting and shortening of leg and pelvic tilt.

of cephalopelvic disproportion and the other because of fetal distress) and five were delivered with the obstetric forceps. The six patients in groups two and three merit some discussion in detail.

Group two

Case 1. First seen in 1966 when 20 years old. Poliomyelitis at the age of 3 years had left her with a grossly wasted right leg and pelvic tilt. The patient wore a caliper on her wasted leg and thus achieved full weight-bearing. The patient had an uneventful

Pregnancy complications

On the whole, the patients of group one (Table 4) were unaffected by their disability. Three of the group required delivery by Caesarean section (two because

TABLE 4. Sequelae of poliomyelitis

	Total no. of patients	Total no. of pregnancies	Main complications	
Group one				
Minimal sequelae	31	42	'Drop-foot'	29
			Wasting	14
Group two				
Moderate sequelae	4	5	Wasting	4
			Pelvic tilt,	4
			Caliper,	3
			Kyphoscoliosis	4
Group three				
Severe sequelae	2	2	Below waist paralysis	2
			Kyphoscoliosis	2

pregnancy and was delivered at term of a female infant weighing 2760 g, the obstetric forceps were used because of delay in the second stage. When seen at the follow-up clinic the patient had had no further pregnancies to date but had full weight-bearing on both legs.

Case 2. This 18-year-old patient was first seen in 1974. Poliomyelitis at 18 months of age had left her with a wasted right leg. The patient had kyphoscoliosis and also pelvic tilt (Fig. 2). She wore a caliper and achieved full weight-bearing with this. Erect lateral pelvimetry in the last weeks of pregnancy showed an anterior posterior diameter of 9.5 cm. The infant's head failed to engage in the pelvis and she was delivered at term by Caesarean section of a female infant weighing 3060 g.

Case 3. This 17-year-old patient was seen in her first pregnancy in 1973. She had had poliomyelitis when aged 4 years which had left her with severe kyphoscoliosis and wasting of the right leg. She had had little ante-natal care and was first seen at 36 weeks' amenorrhoea. Assessment at that time showed the pelvis was reduced in an anterior posterior diameter and the patient was admitted at term in labour with the presenting part not engaged in the pelvis. Lower segment Caesarean section was performed and the female infant weighed 2950 g. She was seen just over a year later in her second pregnancy. The clinical weight-bearing test showed inability to stand on her wasted right leg and although her previous post-natal erect lateral pelvimetry had shown an anterior-posterior inlet diameter of 9.4 cm no other abnormality was obvious on that film. An inlet view of her pelvis did show asymmetry. In her second pregnancy she was again delivered by lower segment Caesarean section of a female infant weighing 2795 g.

Case 4. This 21-year-old patient was first seen in 1974 in her first pregnancy. Poliomyelitis at 1 year of age had left her with kyphoscoliosis, pelvic tilt, and wasting of her left leg. The patient had had muscle transplant surgery and was able to walk without a caliper but the simple weight-bearing test

(Fig. 3) showed that she was unable to bear weight on her affected left leg. Pelvic asymmetry was suspected clinically and confirmed by an inlet view of her pelvis. Caesarean section at term was performed and a female infant weighing 2640 g was delivered.

Group three

Case 1. This 18-year-old patient was first seen in 1974 in her first pregnancy. Poliomyelitis at the age of three had left her paralysed below the waist. She had kyphoscoliosis and wasting of both legs, which resulted in her stature being only 143 cm. She wore calipers on both legs and was fully mobile in spite of her disabilities. Pelvic contracture was obvious clinically and the patient was delivered by lower segment Caesarean section at term of a female infant weighing 3062 g.

Case 2. This 26-year-old primigravid patient was seen in 1974. She had had poliomyelitis when aged 18 months and this had left her paralysed below the waist. She was confined to a wheel-chair as both her lower limbs were wasted and shortened to only 45 cm in length. Kyphoscoliosis reduced her overall height to 99.5 cm. She met her husband at a club for the disabled. He was also confined to a wheel-chair because of paraplegia due to an uncorrected spina bifida. As with the other case in this group there was no abnormality in weight-bearing (as the patient was confined to a wheel-chair and bore no weight on her legs). Although the inlet view of the pelvis was normal the anterior-posterior diameter of the inlet was so reduced that elective Caesarean section was performed when a female infant weighing 3200 g was delivered. The infant had no abnormality.

Discussion

Problems of ante-partum care and delivery of women who have been victims of poliomyelitis are fortunately rarely encountered. Nilsson (1953) reported upon such a case in whom quadriplegia resulted and he also reviewed the previous reports of such patients. Bed-ridden patients and those who

FIG. 3. Unilateral weight-bearing test. The patient is able to stand on her good leg, but immediately collapses when trying to stand on her affected limb.

walked with crutches and bore little or no weight on their legs maintained a large and fairly symmetrical pelvis. True pelvic symmetry occurs if the following factors are present for any length of time (1) associated lumbo-sacral scoliosis; (2) unilateral weight bearing, especially as influenced by the use of external appliances and reconstructive procedures; (3) the shortening of a leg; (4) muscle imbalance, especially with paralysis of the pelvifemoral and pelvispinal muscles; (5) paralysis of muscles below the hip. Few of these complications were seen in the cases reviewed by Hunter and Millikan (1954) as they dealt with patients who suffered the disease during pregnancy. The patients reported in the present series had all suffered the disease as children and consequently the associated factors as detailed above had had time to be effective.

The six patients in groups two and three were the most obviously affected by the disease. Of the five factors listed above as possible causes of pelvic asymmetry, lumbo-sacral scoliosis, shortening of a leg, muscle imbalance and paralysis of muscles below the hip are clinically obvious. Of the two patients in group three one was confined to a wheelchair and as she bore no weight on her legs pelvic asymmetry was not present, but the patient required Caesarean section on a pure disproportion basis. Vaginal delivery in the paralysed patient is possible (Daw, 1973) but the factors listed above would appear to play an important part in patients para-

lysed following poliomyelitis. Short stature following poliomyelitis is expected, being associated with a degree of pelvic contracture.

Respiratory difficulties due to enlargement of the uterus encroaching on a paralysed diaphragm was not seen in the presently reported patients. The two patients in group three, however, had respiratory difficulties in the last few weeks of pregnancy, sufficient to merit admission to hospital for rest, their problem appearing to be one of uterine enlargement taking up so much abdominal space that diaphragmatic excursion was restricted and their lung function, already impeded by scoliosis, was worsened. Bender (1965) reported similar problems in a patient of only 77.5 cm in height. Neither of these paraplegic patients suffered any of the problems recorded by Daw (1973).

Clinical assessment of unilateral weight-bearing is difficult in the patient who is not confined to a wheelchair and appears quite mobile. The simplest test to assess this problem is to ask the patient to stand and bear weight first on one leg and then on the other. Inability to do so is associated with pelvic asymmetry, the asymmetry being on the other half of the pelvis to the one with the 'weak' limb (Fig. 3).

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