PAPERS AND ORIGINALS

Management of pregnancy in patients with hypertrophic cardiomyopathy

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Summary and conclusions

The outcome of 54 pregnancies in 23 patients with hypertrophic cardiomyopathy was analysed. No mother or infant died in the perinatal period. Six patients developed dyspnoea requiring treatment with diuretics. Beta-adrenergic blocking drugs were given in 18 pregnancies and three of the infants in this group were small for dates and in two fetal bradycardia occurred.

The results confirmed that pregnancy is safe in patients with hypertrophic cardiomyopathy. A flexible approach should be adopted towards administering beta-adrenergic blocking drugs to pregnant women with hypertrophic cardiomyopathy. Many such patients do well without these drugs and can thus avoid the potential hazards—namely, small-for-dates babies and fetal bradycardia—that are associated with them.

Introduction

Pregnancy and delivery are usually accomplished without difficulty in patients with hypertrophic cardiomyopathy, for the condition is transmitted by a dominant gene. The theoretical problems of management were discussed by Turner *et al* with reference to nine of our early cases.[1] Since tachycardia, rapid blood loss, and prolonged Valsalva manoeuvres may occur during normal delivery, caesarean section was recommended at first. Then, after several patients had undergone vaginal delivery safely confidence grew and it became clear that caesarean section was indicated only for obstetric considerations. It was concluded that normal vaginal delivery was best, provided that excessive fatigue, cardiac stimulation, and hypotension were avoided. Beta-adrenergic blocking drugs reduce tachycardia and the force of left ventricular ejection, so their use was recommended during pregnancy and eight patients received pronethalol or propranolol without complications. The use of beta-blockers in pregnancy has caused concern recently. Small-for-dates babies, neonatal hypoglycaemia and bradycardia, low Apgar scores, and failure of normal response to anoxic stress have all been reported.[2-4]

We report on our further experience of pregnancy complicated by hypertrophic cardiomyopathy in a larger series of patients, some of whom did not receive beta-blockers.

Patients

Patients were included if they fulfilled the following criteria: angiographically proved hypertrophic cardiomyopathy with presence or absence of a left ventricular outflow gradient recorded at rest and on provocation with amyl nitrite; hypertrophic cardiomyopathy was diagnosed before or during pregnancy; and full antenatal and obstetric details, including drugs given before and during delivery, were available.

Twenty-three patients were included with 54 pregnancies, of which 30 were managed at Hammersmith Hospital and 24 elsewhere. Ten mid-trimester abortions occurred and one therapeutic abortion was performed, leaving 43 pregnancies which went to term.

PROBLEMS DURING PREGNANCY

Ten patients developed pronounced shortness of breath. Six required diuretics and four responded to bed rest. Shortness of breath during one pregnancy did not always recur in subsequent pregnancies. One patient developed angina and in another angina worsened during pregnancy. Both patients responded to treatment with beta-blockers.

PROBLEMS ASSOCIATED WITH DELIVERY

Of the pregnancies, 28 (65%) were spontaneous deliveries, on two occasions at home. Three patients had assisted breech deliveries.

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Ten caesarean sections were performed in eight patients. Table I shows the reasons for abdominal delivery, all but three being performed because of strong obstetric indications. Five patients agreed to undergo sterilisation at operation. Forceps delivery was needed in only five cases (12%), in one because of fetal distress. In another case the patient had been given an epidural anaesthetic.

TABLE I—*Indications for caesarean section in eight patients. (No of pregnancies = 10)*

Indications	No of births	Sterilisation performed
Previous caesarean section	2	Yes
Disproportion	1	No
Previous third-degree tear	1	Yes
Fetal distress, previous hysterotomy	1	No
Age 40, 13-year interval between pregnancies, dyspnoea	1	Yes
Age 39, breech presentation, seven-year interval between pregnancies, and dyspnoea	1	No
Primary cardiac indication	3*	In one case

*Two patients.

PROBLEMS CONCERNING THE INFANT

No infant died in the perinatal period. In two, fetal bradycardia (80-115 beats per min) occurred and persisted for 24-36 hours after delivery, but both babies did well and neither developed hypoglycaemia. The mothers had received propranolol throughout pregnancy and delivery. Three babies were small for dates. In one the pregnancy was otherwise uncomplicated; in the second the infant had asphyxia at birth and mild respiratory distress; and in the third caesarean section was performed for fetal distress. The placenta was small but healthy. The mothers had received propranolol during pregnancy, and two of them took propranolol in the same dosage throughout two further pregnancies, but neither of the infants in these second pregnancies was small for dates. Table II shows complications of pregnancy in those who did and did not receive beta-blockers.

TABLE II—*Complications of pregnancy in women with hypertrophic cardiomyopathy, according to beta-blocker administration*

	No of pregnancies	Smallness for dates	Fetal bradycardia	Mid-trimester abortions	Shortness of breath needing diuretics
Beta-blockers	18	3	2	3	6
No beta-blockers	25	0	0	7	0

EPIDURAL ANAESTHESIA

We recommended that epidural anaesthesia should be avoided because of vasodilatation and reduction in central blood volume, but two patients with florid disease received epidural anaesthesia elsewhere without complication.

Discussion

Our results confirm the earlier impression that pregnancy is well tolerated by patients with hypertrophic cardiomyopathy. No mother or infant died. Our series was representative of the wide range of this disease, including some patients with severe disease and one who had undergone surgical resection of the left ventricular outflow. The development of problems was not associated with any particular feature—for example, problem in previous pregnancy or severity of outflow gradient. Patients whose disease was considered mild did not develop shortness of breath requiring treatment with diuretics. Only two patients developed chest pain of increasing severity, and this responded to treatment with beta-blockers. Delivery in all cases proceeded without cardiac incident, but it seems sensible to follow our original protocol—that is, to avoid factors that would increase left ventricular obstruction and hence decrease cardiac output. Hypotension due to blood loss, violent expulsive effort, fatigue, and cardiac stimulation resulting in increased strength of muscular contraction are all potentially hazardous. Vaginal delivery, however, seems safe in such patients and even assisted breech delivery was allowable, though now that abdominal delivery in breech presentation is increasingly favoured, this would probably not be recommended. Ergometrine should be given routinely and epidural anaesthesia avoided. Antibiotic prophylaxis against endocarditis should be given.[5]

Although beta-adrenergic blocking drugs have a beneficial haemodynamic effect and might also act as antiarrhythmic agents, their protective value in hypertrophic cardiomyopathy is questionable. Pregnancy is associated with increased ventricular ectopic activity[6] so it might be argued that pregnant patients with hypertrophic cardiomyopathy are particularly at risk of sudden death due to arrhythmia and should be protected by beta-blockers. Our experience does not support this theory. Four of our patients have died since the study ended, though none died during pregnancy. Analysis of a further 58 pregnancies, excluded from the study on the grounds of insufficient obstetric data, also disclosed no sudden maternal death. Results of recent continuing studies suggest that the incidence of clinically important ventricular arrhythmias in hypertrophic cardiomyopathy is not affected by administering beta-blockers.[7]

Our series was too small to provide evidence to incriminate beta-blockers as a cause of small-for-dates babies and fetal bradycardia. Nevertheless, results of our report combined with those of others, suggest that it would be wise to monitor fetal growth in these cases particularly carefully. Heart rate and blood sugar concentration in the neonate should also be observed for the first 48 hours, since the effect of beta-blockers persists for considerably longer than the pharmacological half life of the drug in the adult.[3] These recommendations amount to no more than good modern obstetric practice.

The decision whether to administer a beta-blocker should be made individually. When symptoms, particularly angina, are relieved by beta-blockers they should be given, but other patients do well without these drugs and can thus avoid the possible hazards associated with them. It seems reasonable, therefore, to adopt a more flexible approach than we originally suggested.

Occasionally patients ask about the eugenic aspect of their disease. While pregnancy is apparently safe, there is a high risk of the child being affected. In a condition whose symptoms range from very mild to aggressively severe it is difficult to advise wisely. It is worth noting that families tend to run "true-to form"—that is, the severity in one generation is similar in the next. Five of our patients were sterilised, but with the current problems of adoption this is a difficult decision, especially when the patient is young.

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References

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