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Routine Elective Cesarean Section Is Not Justified for Women With Mechanical Heart Valves

We congratulate Vitale et al. (1) for providing substantive evidence for a dose-dependent effect on adverse fetal outcome in pregnancies complicated by maternal warfarin therapy. In the United Kingdom, warfarin embryopathy is rare (2), and recently reported cases have occurred almost exclusively in women taking large (>9 mg) doses of warfarin (3). We agree with Vitale et al. (1) that the small risk of embryopathy (3.4% in their series), which may be confined to those requiring >5 mg to maintain an adequate International Normalized Ratio (INR), should not be used as a justification for recommending that women with prosthetic valves be managed with heparin throughout their pregnancy, as some have suggested (4). Indeed, an increased incidence of valve thrombosis in pregnant women with mechanical valves (albeit mostly older-generation prostheses in the mitral position) (5), managed with subcutaneous heparin versus warfarin, has been reported (6). However, Vitale et al. (1) have highlighted the risks of spontaneous miscarriage and stillbirth in warfarin-managed pregnancies and have demonstrated that this too is dose-dependent.

We have two concerns: First is delivery with only brief (two-day) discontinuation of warfarin therapy. As Vitale et al. pointed out, the immature fetal liver may not only lead to over-anticoagulation of the fetus despite a normal INR in the mother, but also slow clearance of warfarin by the fetus, leading to continued anticoagulation for up to 10 days after the mother stops taking warfarin. Although there were no cases of neonatal hemorrhage in this series, despite the fact that warfarin was almost certainly still present in the fetuses at the time of delivery, the numbers are small and only three babies in the >5 mg group had reached full term; second is the policy of routine elective cesarean section at 38 weeks. We do not agree that elective cesarean section "reduces the risk of perinatal intracranial hemorrhage in the fetus." The arguments have been well rehearsed for other maternal conditions such as autoimmune thrombocytopenic purpura (7) and hemophilia carriers (8), when there may be a risk of intracranial hemorrhage in the baby. Indeed, neonatal intracranial hemorrhage is described after cesarean section in both conditions, and the current advice is to recommend vaginal delivery (7,8). Pregnancy increases the risk of valve thrombosis. The time of greatest risk for venous thrombosis is immediately after delivery, and cesarean section further increases the risk up to 25-fold (9). We agree with Elkayam (5), and it is our policy to discontinue warfarin and start intravenous heparin, which does not cross the placenta and has a very short half-life, at 36 weeks in preparation for induction of labor or cesarean section at 38 weeks. We reserve cesarean section for the usual obstetric indications. Because Vitale et al. (1) state that "if the patient [on <5 mg of warfarin] prefers to have vaginal delivery, intravenous heparin over the last two weeks of gestation should be offered as an option," we assume that they deem this to be a safe alternative. We would suggest that perhaps the emphasis should be reversed from routine cesarean section to routine vaginal delivery.

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PII S0735-1097(00)00557-X

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REPLY

We read with great interest the letter by Nelson-Piercy et al. regarding our article (1). They gave us the benefit of their experience.

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We appreciate the points raised by them—that is, their concern about the discontinuation of warfarin only two days before cesarean section and the consequent hemorrhagic risks for the fetus.

Pregnancy increases the risk of valve thrombosis (2); therefore, we had two main concerns at the time we devised our policy for pregnant women with mechanical valves: 1) protecting the mother from valve thrombosis; and 2) reducing the risk of fetal complications as much as possible.

Undoubtedly, warfarin is considered to be the best anticoagulant agent for patients with mechanical valves (3). Even though intravenous heparin has been used in the management of pregnant women, the thromboembolic risk was found to be four to five times higher for women taking heparin than for those taking an oral anticoagulant agent (4). In our experience, in a general population, we have observed a higher rate of thromboembolic and thrombotic complications in patients with first- and second-generation mechanical valves as compared with bileaflet valves (5). Because 34 of 43 patients in our series had caged-ball or tilting disc valves, mostly in the mitral position, we opted for the anticoagulation management that enabled us to minimize the thrombotic risk during the entire gestation period.

We agree that warfarin is still present in the fetus at the time of cesarean section, but no hemorrhagic complications have been observed in our series. Unfortunately, the International Normalized Ratio (INR) levels in the babies were unknown, and therefore it was difficult to assess the extent of anticoagulation in the fetus. Ideally, the fetal INR should be checked soon after birth.

With respect to the authors' concern for the fetus during programmed cesarean section, we have not observed any untoward effect of this procedure on the babies. Moreover, no deep vein thromboses were observed in our patients, despite the high risk pointed out by the authors.

Finally, with respect to their recommendation to use heparin at 36 weeks in preparation for induction of labor or cesarean section at 38 weeks, we consider this policy applicable in selected patients. We consider warfarin a better anticoagulant agent for patients with first- and second-generation mechanical valves in the mitral position. Therefore, we do not know whether heparin will yield results as satisfactory as those with warfarin in reducing the thrombotic risk in this subset of patients. In contrast, patients with bileaflet valves may be managed with intravenous heparin during their last two weeks of gestation, keeping in mind the side effects of heparin (6) and the prolonged hospital stay.

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PII S0735-1097(00)00562-3

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