The choice of optimum obstetrical tactics in pregnant women with rheumatic heart disease: Delivery through natural maternal passages or caesarean operation?

The choice of optimum tactics of labor management and post-natal period in pregnant women with valvular heart disease is one of the most effective ways of decreasing of maternal and perinatal mortality. We carried out the comparative investigation of the results of labors in pregnant women with mitral heart disease depending on the method of delivery. The obtained results showed that during delivery of pregnant women with mitral heart disease through natural maternal passages the indices of central hemodynamics were relatively more stable; the course of post-natal period and the new-born children’s condition was more favorable.

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Introduction

Cardiovascular diseases in pregnant women have remained nowadays one of the main reasons of pregnancy after-effects, labor, perinatal disease and mortality.

The data in literature testify to the fact that two thirds of maternal mortality with heart disease are related to post-natal period (Swiet, 2000; Szekely and Snaith, 1994). The reasons for the lethal outcome are acute right ventricular failure, caused by hypertension of the lungs, arrhythmia, oedema of the lungs, thromboembolism complications (Swiet, 2000). The choice of optimum tactics of labor management and post-natal period in pregnant women with heart valvular disease is one of the most effective ways of decreasing of maternal and perinatal mortality. There is not any unambiguous decision concerning the method of delivery in women with mitral heart disease. Some investigators think that it is advisable to realize labor management through natural maternal passages with shortening of the second period with mitral stenosis and cardiac failure of I - II functional classes. In case of cardiac failure of III - IV classes the planned caesarean operation within 36-37-weeks is recommended. The other authors adduce arguments in favour of surgical delivery in order to prevent perinatal after-effects (Oakley et al., 2003).

According to Glotova’s opinion (2005) the softest method of delivery in the presence of fetal placental failure is caesarean operation. Apseryan (2009) holds the same opinion too. According to Mravyan and Petrukhin (2010) delivery through natural maternal passages are possible in patients with CF of I - II FC and systolic arterial pressure in lung artery lower than 40-50 mm m.e. and even in women with CF of III - IV FC and monitor control of hemodynamics applying catheterizing of lung artery. In spite of this the authors note that the most often delivery was managed by means of caesarean operation.

At the same time in the experts’ consensus - document it was noted that caesarean operation with its chance to avoid stress connected with labor was not a soft method in stenotic heart valvular disease as it promoted the development of ‘hemodynamic stroke’ at the expense of blood rush from contracted uterus and, consequently, overloading of cardiovascular system (Oakley et al., 2003). Not all investigators follow such tactics. For
example, according to Repina and Kuzmina-Krutetskaya’s opinion (2008) ‘hemodynamic stroke’ or blood flow into general vascular system takes place during every birth pang and all the more - after deliverance of uterus from fetal ovum, irrespectively of the method of delivery.

There are several additional arguments in favour of surgical delivery in case of mitral stenosis. Firstly, this heart disease is connected with very unfavourable outcome for a foetus (arrested development), prematurity, chronic and acute hypoxia, traumatism possible during natural delivery with shortening of expulsion of fetus and the others). Secondly, current pregnancy in gravely ill women can be the only chance to get not only a viable but a relatively healthy child. These moments should be taken into consideration while choosing of the delivery method (Repina and Kuzmina-Krutetskaya, 2008).

Taking into account the arisen circumstances, the aim of our investigation was to study the outcomes of delivery in pregnant women with RHD depending on the type of heart disease and the delivery method.

**Materials and methods**

From the total amount of women in childbirth with MS (117) - 17 had surgical delivery, 100 - had labor management through natural maternal passages. From the total amount of pregnant women with insufficiency of mitral valve 14 had caesarean operation and 76 - had labor management through natural maternal passages.

During post-natal period parallel with the estimation of some clinical parameters: general condition, complaints, symptoms of cardiac decompensation, rates of involution of uterus, condition of mammary glands, the dynamic analyses of ECG, laboratory and instrumental methods was carried out. The investigation of functional condition of myocard and structural-geometric parameters of heart was accomplished by means of echocardiography (EchoCG) while using USI apparatus, scanner Echo Doppler Philips company - 1500, Germany production, cardinal sensor with power of 2.5-4.5 mcps, according to standard method.

The calculated methods of estimation of central and peripheral hemodynamics according to standard formulas (stroke output (SO), cardiac index (CI), cardiac output (CO), general peripheral vascular resistance (GPVR), discharge fraction (DF), final diastolic volume (FDV), final systolic volume (FSV) were conducted.

**Results and discussion**

There wasn’t registered any cardiac failure (CF) in 52.2% (47) among pregnant women with IMV, 30 women (33.3%) had symptoms of CF of I degree, and 8 women (8.9%) had symptoms of CF of II a degree.

There weren’t any symptoms of disturbance of blood circulation in 58 (44.6%) pregnant women with MS, 46 women (35.4%) had symptoms of CF of I degree.

Among investigated pregnant women with MS 22 (16.9%) had symptoms of CF of II a degree and 4 (3.1%) - II b degree.

According to literature data the highest amount of lethal outcomes in women with RHD was observed in post-natal periods (Swiet, 2000; Szekely and Snaith, 1994). It is known that immediately after the child’s birth sharp redistribution of blood ensues and, as a result, acute disturbance of blood circulation can ensure (Zabolotskih et al., 2002; Abdusalamova et al., 2009).

Comparative investigation of post-natal period in women with RHD depending on the method of delivery showed that considerable hemodynamic indices were stated in women in childbirth after surgical delivery. If during labor 300-500 ml of blood is rejected on the average into vascular channel as a result of uterine activity, which is accompanied by a sharp 80% increase of cardiac output, during caesarean operation a big volume of blood
of approximately 1000.0 - 2000.0 ml from uterine vascular system as a result of fast uterine activity during a short period of time transfers into vascular channel provoking a sharp overloading of the right sections of the heart (Repina and Kuzmina-Krutetskaya, 2008). The present circumstance is of special importance in the presence of heart vascular disease which is often accompanied by development of right ventricular failure and oedema of the lungs.

Diseased heart with hemodynamic displacements is not able to adapt to fast changing circumstances of post-natal period when the blood volume increases abruptly owing to ceasing of uterus placental blood circulation. On the contrary in cases when pathological haemorrhage is added considerable decrease of BV takes place and the attempts of fast supplying of BV can lead to negative consequences up to development of acute cardiovascular failure with lethal outcome (Repina and Kuzmina-Krutetskaya, 2008).

Comparative investigation of hemodynamic indices in maternity patients depending on the method of delivery showed that the central hemodynamic indices were relatively stable in pregnant women with RHD during delivery through natural maternal passages. Reliable high indices of 80 were registered during conservative delivery for both in women with IMV, and with MS (82.4±1.4 ml against 78.6±2.2 ml, p<0.05 and 82.4±1.8 ml against 74.4±1.6 ml, accordingly (p<0.01)). During abdominal delivery FDV and FSV indices were reliably higher. Thus, FDV in women with IMV after caesarean operation was 152.4±4.8 cm$^3$ against 140.2±1.8 cm$^3$ during delivery (p<0.05). Analogous dynamics was observed as well in women with MS: 154.4 ± 1.8 cm$^3$ against 146.4±1.6 cm$^3$ (p<0.01), FSV indices in maternity patients with IMV and those delivered through natural maternal passages were 38.8±0.8 cm$^3$ against 42.6±1.4 cm$^3$ - with caesarean operation (p<0.001). Maternity patients with MS had FSV of 44.6±1.2 cm$^3$ after natural deliveries against 48.4±1.4 cm$^3$ after caesarean operation (p<0.05). Concerning CI and SI data - they were reliably low in maternity patients with IMV and MS. Maternity patients with IMV after surgical delivery had reliably low DF, both in women with IMV and with MS.

The results of differential studies of post-natal period course in maternal patients with RHD depending on the method of delivery testify to the fact that more favourable course was registered during conservative labor management. Occurrence of such after-effects as tachycardia disorder, fluttering arrhythmia, exacerbation of the rheumatic process were more often registered in cases of abdominal delivery in patients with MS as well.

According to Repina and Kuzmina-Krutetskaya’s opinion (2008) it is advisable for the patients with mitral regurgitation to have labor management through natural maternal passages with shortening of expulsion of fetus.

Delivery outcomes through natural maternal passages in pregnant women with RHD have a number of advantages for new-born children in comparison with surgical delivery. Thus, with caesarean operation in pregnant women with IMV pneumopathy and syndrome of respiratory disorders, were registered 2.5 times more in comparison with conservative delivery and hyperexcitability syndrome - 2 times more. The outcomes of conservative delivery in pregnant women with RHD have a number of advantages for new-born children compared with surgery delivery; decrease of SRD and hyperexcitability syndrome were registered.

**Conclusion**

Thus, delivery through natural maternity passages with adequate analgesia is more preferable in pregnant women with RHD. Surgical delivery has rather unfavourable hemodynamic after-effects, connected with analgesia, risk of thromboembolism complications; loading of cardiovascular system the organism experiences during operation due to sharp redistribution of blood is highly considerable. The course of post-natal and neonatal period is also more favorable during conservative labor management in women with RHD.
The results of the study give reason to reconsider the feasibility of traditional obstetric tactics for women with RHD. Some encouraging data regarding the possibility of prolonging pregnancy in women with RHD and conservative management of labor were obtained. However, some provisions require further investigations and implementation of some new technologies to prepare pregnant women with RHD for childbirth with the signs of heart failure.

References


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