Chapter

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Management of Valvular Heart Disease in Pregnancy

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Pregnancy introduces many physiologic cardiovascular changes in the maternal system. They include high volume state, higher cardiac output, anemia, changes in viscosity and coagulable state. These changes achieve the highest proportion at the end of second trimester. All the above changes could prove detrimental to a pre-existing valvular heart disease especially of moderate to severe variety.[1,2] Rheumatic valvular heart disease is seen commonly in women of childbearing age and sound use of scientific knowledge can bring in safety for the mother and the fetus.

Absolute Contraindications for Continuation of Pregnancy[2]

1. Severe MS, AS, PS with Class IV symptoms in 1st trimester. Stenotic lesions are poorly tolerated in pregnancy.
2. Severe MR, AR with LV dysfunction (LVEF < 40%). Regurgitant lesions are well tolerated in pregnancy but LV dysfunction indicates advanced disease.
3. Any valvular heart disease with severe PH (PA systolic pressure more than 75% of systemic systolic pressure). PH is poorly tolerated and leads to maternal mortality.

Relative Contraindications for Continuation of Pregnancy

1. AS, PS, MS with class II symptoms. Severity of lesions should be studied carefully to make a decision.
2. Prosthetic valve requiring anticoagulation. Successful pregnancy in a woman with prosthetic valve is an ordeal. It is mainly related to anticoagulation, thrombosis, hemolysis and warfarin embryopathy[3].
3. AR with Marfan's syndrome. Severe AR with cystic medical necrosis carries a risk of aortic dissection during pregnancy[4].

General Principles to be followed

1. Pregnancies should be encouraged on diseased native valves as compared to replaced prosthetic valves. Natural valves are easier to manage during pregnancy due to less issues related to anticoagulation, thrombosis, embryopathy[5].
2. Whenever possible, obstetric career should be completed quickly in a prospective mother with valvular heart disease, e.g. a prospective mother with moderate MR should have two children in quick succession when the pregnancies can be tolerated

LIST OF ABBREVIATIONS

MS	Mitral Stenosis
AS	Aortic Stenosis
PS	Pulmonary Stenosis
MR	Mitral Regurgitation
AR	Aortic Regurgitation
PH	Pulmonary Hypertension
LSCS	Lower section caesarian section
UFH	Unfractionated heparin
LMWH	Low molecular weight heparin
INR	Internationally normalized ratio

rather than wait for a few years in which the valve hemodynamics may worsen.

3. Rheumatic and endocarditis prophylaxis principles remain same with or without pregnancy[6].
4. Change to pregnancy safe cardiac medication should be effected in all ladies of childbearing age when family planning measures are not used and pregnancies are contemplated. Chest X-rays should be avoided in women with valvular heart disease of childbearing age.
5. Evaluation with color doppler should be done when pregnancy gets confirmed and at the end of second trimester.
6. Bioprosthetic valves are safer during pregnancy but can get degenerated faster due to rapid turnover of calcium during pregnancy.[7]
7. Metallic valves cause problems related to anticoagulation, hemolysis, etc. but last longer despite pregnancies[8].

Corrective interventions possible during pregnancy (end of second trimester)

The percutaneous balloon procedures are done under local anesthesia. Lead shield is used under the mother's lower body to shield the fetus from radiation. Small dose of radiation to the fetus at end of second trimester is safe[9].

1. Balloon mitral valvuloplasty: Success rate of this procedure is very high and even class IV status patients can have a safe delivery following this procedure.
2. Balloon pulmonary valvuloplasty: Holds the same status as the mitral valvuloplasty.
3. Balloon aortic valvuloplasty: Success rate is low. Also this procedure will be a mere palliation to sustain through to the delivery.
4. Closed mitral commissurotomy: This is now replaced by balloon valvuloplasty, but in occasional cases can be undertaken with remarkable safety.

General principles of management

1. Atleast eight hours of rest at night and one hour rest during daytime.
2. Encourage left lateral position for resting.
3. Adequate safe decongestive treatment to achieve functional class II.
4. Maintain adequate nutrition to maintain good muscular strength.
5. Achieving Hb levels of atleast 10 gm%.

Principles for safe delivery

1. Planned LSCS at earliest possible gestational period in high-risk cardiac patients. Neonatologist should indicate the safety of delivering the pre-term fetus.
2. Shorten second stage of labor by assisted deliveries. This principle includes early induction, generous episiotomies and forceps assistance.
3. Adequate analgesia to avoid pain-related tachycardia. In a valvular heart disease patient, volume overload and tachycardia, both affect the hemodynamics.
4. Endocarditis prophylaxis for deliveries should be recommended for all types of deliveries.
5. IV diuretics in immediately post-delivery period to overcome sudden volume overload.

Mitral Stenosis, Aortic Stenosis, Pulmonary Stenosis

1. Mild, with class II symptoms: General measures as indicated above.
2. Moderate-to-severe disease with symptoms class III : Conserve till end of second trimester and subject to balloon valvuloplasty with lead shield protection.
3. Severe disease with severe symptoms: Terminate pregnancy, correct valvular disease by balloon valvuloplasty and then plan pregnancy.

Mitral Regurgitation, Aortic Regurgitation

1. Mild disease with class II symptoms: General measures as above.
2. Moderate lesions, class III symptoms, no LV dysfunction/PH: General measures.
3. Moderate/severe lesions, class IV symptoms/PH/LV dysfunction: Terminate pregnancy and avoid future pregnancies.

Management of Patients Already on Warfarin (Prosthetic Valve)

With warfarin, the fetal risk increases but maternal risk is taken care of[10]. Warfarin embryopathy is particularly dangerous when mother is on warfarin in the first six weeks.

By changing to continuous IV UFH or SC LMWH, the fetal risk is low, but maternal risk of ineffective anticoagulation increases. For Indian conditions, where continuous IV UFH for prolonged periods is not feasible or when long-term use of LMWH is expensive, best-suited regimen is:

1. Continue warfarin with INR maintained between 2.5 and 3 during pregnancy. Here, the small risk of warfarin embryopathy is considered a lesser evil compared to continuous IV UFH.
2. Add 75 mg Aspirin for weeks 13 to 30 in addition to warfarin[11].
3. Stop warfarin two weeks before planned delivery and use continuous IV UFH or SC LMWH twice a day till delivery takes place. (Ideally LMWH should be used only if anti Xa levels can be monitored).

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