MICRO LABS LIMITED

GYNAE SPECTRUM

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Dear Doctor,
Greetings from Micro Labs. We are happy to bring you "Gynae Spectrum", which contains latest and interesting news in the field of Obstetrics and Gynecology.

This issue contains:

Should you require any article or, medical information, please feel free to contact us medicalservices@microlabs.in

Looking forward to your valuable feedback.
Best Regards,
Medical Team, Micro Labs Limited

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1. Single or multiple-unit transfusion in hemodynamically stable postpartum anaemia?

Introduction

Post-partum anaemia is a common health issue with increasing prevalence.There exists recommendations regarding the management of an acute postpartum haemorrhage, including the use of massive blood transfusion protocols when indicated. This study aimed to compare a single- vs. multiple-unit transfusion protocol for treatment of hemodynamically stable postpartum anaemia.

Methods

A prospective, randomized, trial comparing the transfusion of single unit of packed red blood cells [pRBCs] (single-unit protocol) to 2 units of pRBCs (multiple unit protocol).

Postpartum women >6 hours from delivery who required transfusion were included in the trial.

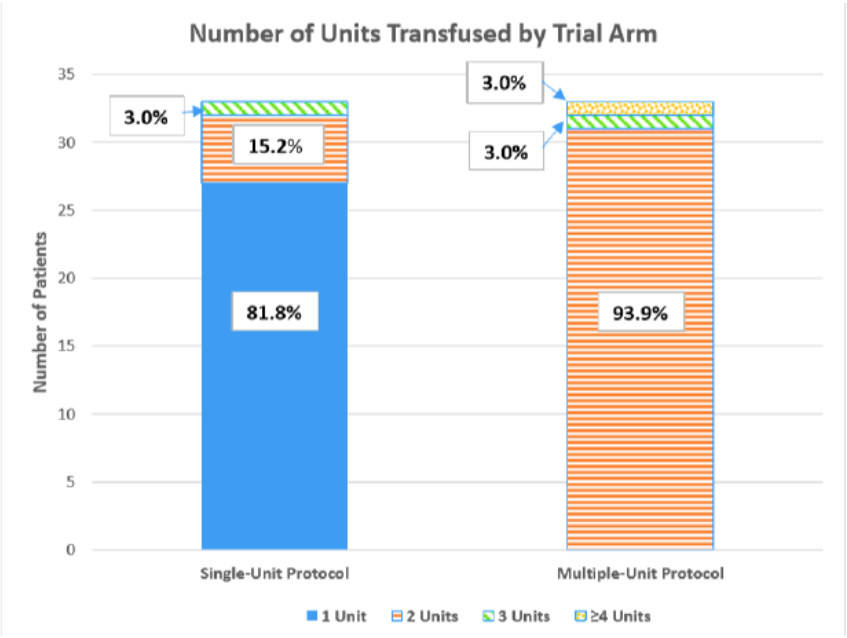
Exclusion criteria composed of pregnant women with Unstable vital signs, haemoglobin (Hb)< 5g/dL, hemoglobinopathy, and cardiomyopathy.

Haemoglobin assessment and standardized clinical evaluation were carried out 4-6 hours after transfusion; additional pRBCs were given if required.

The total units transfused was the primary outcome. Secondary outcomes comprised of length of stay, endometritis, wound separation/infection, venous thromboembolism, and intensive care unit admission within 30 days postpartum.

Results:

The total study subjects were 67 women, 33 women in treatment arm and 34 in control arm. No differences were found between groups in demographic or clinical characteristics, including delivery mode, blood loss, and randomization Hb. The number of units transfused was found to be lower in the single- compared to the multiple-unit protocol (1.2u vs. 2.1u, p< 0.001). Only 18.2% of women in the single-unit arm required additional pRBCs. At post-transfusion Hb assessment, women in the single-unit arm had lower Hb (7.8g/dL vs. 8.7g/dL, p< 0.001), but there were no differences in vital signs or symptoms between groups. Length of stay, 30-day complications, or 4-9 week postpartum outcomes were found to be similar.



Conclusion
Single – unit transfusion avoided a second unit of packed red blood cells in >80% of women without significant impact on morbidity in women with stable post partum anaemia.

Reference:
Hamm RF et al.. Single-unit vs multiple-unit transfusion in hemodynamically stable postpartum anemia: a pragmatic randomized controlled trial. Am J Obstet Gynecol. 2021 Jan;224(1):84.e1-84.e7.

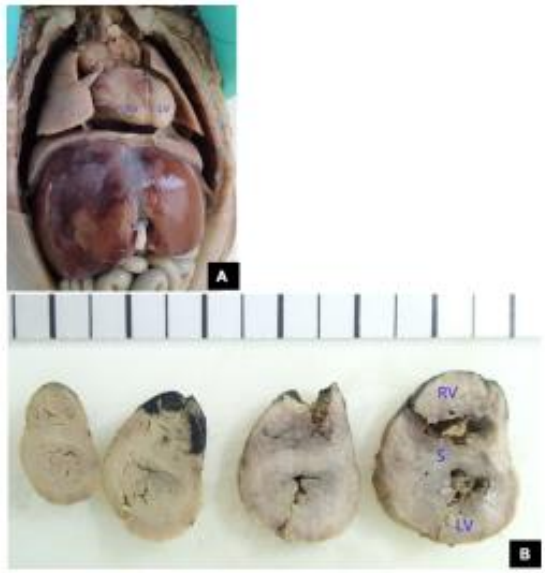
2. Foetal hypertrophic cardiomyopathy in second trimester of pregnancy – Ultrasound and genetic detection

Introduction
Cardiomyopathies (CM) are associated with compromised cardiac function in varying degrees of severity. CMs are not quite common in foetuses. CMs usually do not have a definitive cause, with only 33%-44% having an identifiable risk linked to genetic, familial, infectious or metabolic causes. Hypertrophic CMs which has a familial predisposition is rare and often is associated with low chances of survival of the foetus.

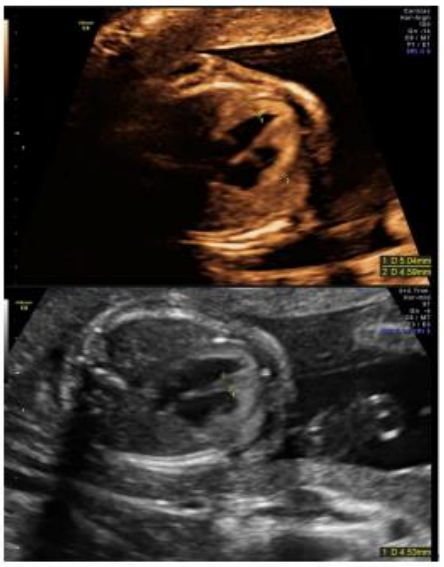
Case Report
A 32-year old women, with absence of any gestational diabetes presented at 23 weeks of gestation, following a diagnosis of familial HCM during current pregnancy. The genetic analysis of the family member (mother of pregnant women) was carried out and the variant c.559A>G (p. Asn187Asp) in heterozygosity for the MYH7 gene (NM_0002547.4) was detected.
The fetal echocardiogram (at 23 weeks) revealed a symmetric thickening of the fetal biventricular cardiac walls and interventricular septum, measuring about 5mm and 4.5mm, respectively. The family variant in heterozygosity for the MYH7 gene was detected in the foetus by DNA sequencing following which pregnancy was terminated at 24 weeks of gestation. Cardiac function was well-preserved with normal atrial and venous Doppler. Ventricular outflow did not have any obstruction.

The autopsy of the fetus showed concentric biventricular hypertrophy and no other morphological anomalies. In the fetus, a detailed diagnosis of the type of CM and prenatal diagnosis of HCM was challenging, specifically in an early stage due to its high variability in expression and uncertainty in evolution.

Usually, the scans are normal at 20+ weeks of gestation and HCMs are detected at 30+weeks of gestation. Accurate diagnosis of HCMs and the prediction of functional outcomes constitute the mainstay in the management of pregnancy.



(A) In situ view of the heart. (B) Serial section showing biventricular hypertrophy and septal hypertrophy. Right ventricular (RV) thickness 5mm; left ventricular (LV) thickness 4mm; septal (S) thickness 3–5mm.



The fetal echocardiogram (23 weeks) revealed normal heart size, symmetric thickening of the biventricular walls and interventricular septum, measuring about 5 mm and 4.5 mm, respectively.

Key Points

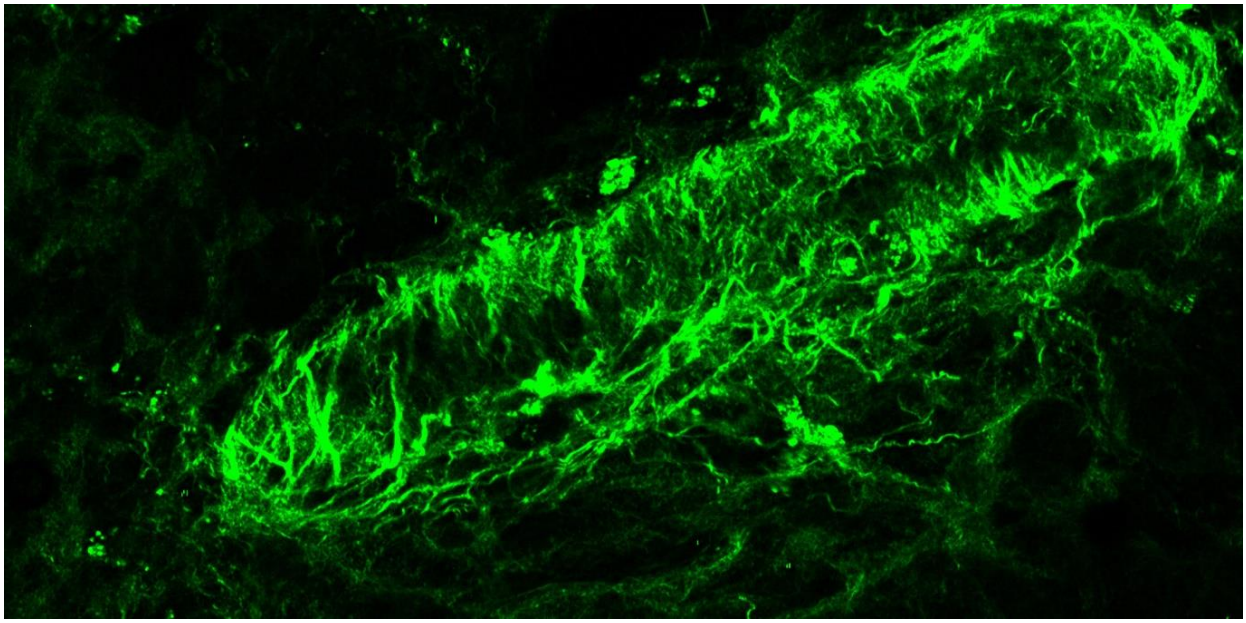
- In the fetus, sonographic appearance of the myocardium can provide only an initial assessment of cardiomyopathy.
- In the fetus, a detailed diagnosis of the type of CM and prenatal diagnosis of HCM was challenging, specifically in an early stage due to its high variability in expression and uncertainty in evolution.
- Key finding presented in this report is the variant MYH7 (NM_000257.4):c.559A>G (p.Asn187Asp), which is described for the first time and is likely pathogenic.

Reference:
Soares C et al. Ultrasound and genetic detection of fetal hypertrophic cardiomyopathy in second trimester of pregnancy. BMJ Case Rep. 2021 Jan 6;14(1):e239773.

IN FOCUS

3. Study uncovers an important cause of Pre-eclampsia

Preeclampsia is a hypertensive and inflammatory pregnancy disorder associated with cholesterol accumulation and inflammation at the maternal-fetal interface. But there is only limited knowledge about the way pre-eclampsia develops.

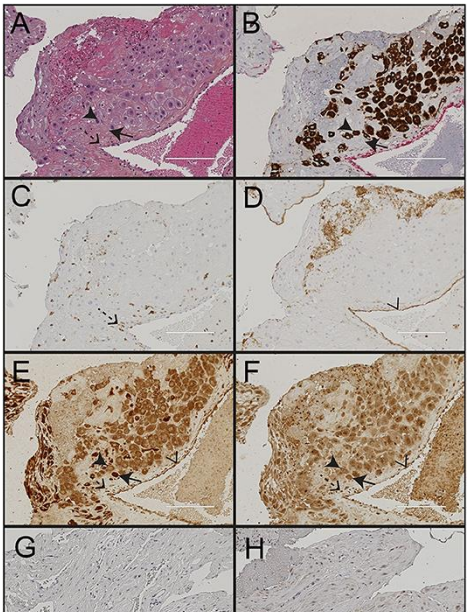


Cholesterol crystals in decidual tissue. ***Credit: NTNU***

Researchers have studied the role of Cholesterol crystal mediated NLRP3 inflammasome activation is the main mechanism to cardiovascular disease and the pathway has been implicated in placental inflammation in preeclampsia.

The study included Pregnant women with normal (*n* = 43) and pre-eclamptic pregnancies with (*n* = 28) and without (*n* = 19) FGR were included at the time of delivery.

Cholesterol crystals were imaged in the decidual tissue by using second harmonic generation microscopy and polarization filter reflected microscopy. Immunochemistry was employed to carry out quantitative expression analysis of $NLRP_3$, IL-1β and cellular markers. Cholesterol crystals were found to be located in tissue stroma as well as near uterine vessels. Significant variations were found between the pregnancies with respect to cholesterol crystals in decidual explants.



Immunohistochemical staining of decidua from a normal pregnancy. Representative images of decidual tissue from a normal pregnancy at gestational age 40 weeks. **(A)** HES; **(B)** the trophoblast marker cytokeratin 7 (CK7); **(C)** the endothelium marker CD31; **(D)** the leukocyte marker CD45; **(E)** nod-like receptor protein (NLRP)3; and **(F)** interleukin (IL)-1β. Negative isotype control shown for **(G)** NLRP3; and **(H)** IL-1β. Black arrowheads indicate trophoblasts, black arrows indicate maternal decidual stroma cells, and dashed arrows indicate maternal leukocytes and transparent arrowhead indicate endothelial cells.

Decidual expression of the inflammasome components NLRP3 and IL-1β was located to fetal trophoblasts and maternal leukocytes and was significant in areas of proximity between these cell types. Crystal activation of IL-1β in cultured decidual explants was used to confirm pathway functionality. Preeclampsia without FGR was associated with increased trophoblast dependent NLRP3 and IL-1β expression, particularly in the decidual areas of trophoblast and leukocyte proximity.

The study results suggest that decidual accumulation of cholesterol crystals leads to activation of NLRP3 inflammasome which contributes to decidual inflammation and that this pathway works strong in areas with close maternal-fetal interaction in preeclampsia without FGR.

Reference:
Silva GB et al. Cholesterol Crystals and NLRP3 Mediated Inflammation in the Uterine Wall Decidua in Normal and Preeclamptic Pregnancies. Front Immunol. 2020 Oct 8;11:564712.