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Fetal and Neonatal Alloimmune Thrombocytopenia (FNAT), laboratory investigation and treatment modalities

Fetal and Neonatal Alloimmune Thrombocytopenia (FNAT) is a clinical syndrome occurring due to mismatch between the mother's platelets and those of the baby i.e. when certain platelet antigens (HPA) that the fetus inherited from the father are not present on the mother's platelets. FNAT is estimated to occur in as many as 1-2 in 1-5000 live births. 20-59% cases of FNAT are reported in first-born children. The disease is similar to haemolytic disease of the newborn caused by alloimmunisation to red blood cell antigens. FNAIT is suspected if an unexplained isolated thrombocytopenia is present in the new-born (most commonly ranging between 10x109/L and 30x109/L). Since fetal HPA antigens develop as early as in the 16th week of gestation, thrombocytopenia may cause bleeding episodes and put the fetus at a long-term risk, even before birth. In 80-90% of cases, FNAT is caused by anti-HPA-1a antibodies. Anti-HPA-5a are the second most frequent antibodies, whereas other antibodies are seldom to be found. Final diagnosis confirmation requires serological testing for FNAT, proving the existence of specific platelet antibodies of the IgG class in the mother's serum, which crossed the placenta and entered the baby's bloodstream, and are bound to fetal/neonatal platelets. Laboratory testing for FNAT usually covers serology screening for antiplatelet antibodies in the mother's and the child's blood sample, establishing HPA characteristics of the present alloantibodies, HPA genotyping of the mother and the child/father, establishing antibody titres, and a platelet transfusion. Prenatal serological/molecular screening for FNAT and establishing antibody titres is not strictly required, and it is done only if a severe case of FNAT, caused by anti-HPA-1a antibodies, was identified in the previous pregnancy. Treatment: FNAT caused by anti-HPA-1a antibodies and confirmed in the previous pregnancy is treated prenatally by administering Intravenous Immunoglobulin (IVIG) to the mother during pregnancy. Postnatal treatment of severe cases of FNAIT primarily consists of HPA-compatible platelet transfusions, usually together with IVIG. Conclusion: The exact frequency of FNAT is unknown in most of the countries since the recorded cases of FNAT refer only to certain institutions or referral centres of certain countries. Although this is a rare disease, the severity of clinical features and consequences linked to central nervous system haemorrhage require early serological diagnostics. Selection of platelets for neonatal transfusion according to HPA characteristics of maternal alloantibodies, obtained from an HPA negative donor by apheresis, is the most effective method of FNAT treatment. Usage of IVIG during pregnancy in cases of confirmed FNAT caused by anti-HPA-1a antibodies contributes significantly to the prevention and aimed treatment of this disease.

Biography: Maja Tomicic is currently working at Croatian Institute of Transfusion Medicine (CITM) as Head of Department for Platelet and Leukocyte Diagnostics and Haemostaseology, and Education Department and Specialist of Transfusion Medicine, from 1992 and as Scientific Assistant, University of Zagreb Medical School from 2012. CITM is National Blood Transfusion Center that collects and test donor's blood, produces blood products and performs pre-transfusion testing patients and pregnant women. As a Head of Department, she has responsibilities for development and introduction of methods for platelet and leukocyte immunogenetic and hemostasis testing for outpatients, blood products quality control hemostasis testing, and investigation of transfusion associated acute lung injury (TRALI), Post Transfusion Purpura (PTP), Fetal and Neonatal Alloimmune Thrombocytopenia (FNATP) and neutropenia (ANN). She has published 28 papers; 19/28 cities in CC, 11/28 classified as scientific paper, MS thesis; "Frequency and significance of anti-platelet antibodies in pregnant women and hematology patients", PhD thesis "Serological, molecular and clinic characteristics of alloimmune neonatal neutropenia", 62 congress abstracts, 24/59 in CC journals, 37/59 in "Index Medicus" journals.

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