Global Journal of Medical Research: E
Gynecology and Obstetrics
Volume 18 Issue 4 Version 1.0 Year 2018
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Fetomaternal Hemorrhage - A Mystery Entity

By Maria Zormpa & Dr. Alfred Schleiss

Abstract- Fetomaternal hemorrhage is a well - recognised cause of neonatal morbidity. The diagnosisis not easy to make as the clinical symptoms if present, can be very subtle. There are diagnostic tests, as the rosette screen and Kleihauer-Betke test that can confirm the cinical suspicion and typical prenatal ultrasound signs and pathologic allaboratory results at delivery that confirm the underlying pathophysiology of the condition.

We have gone through the upto date literature and present the latest findings on fetomaternal hemorrhage. However, more studies need to be carried out to shed light to other risk factors, clinical and laboratory data associated with the disease, to decrease the fetal and perinatal morbidity and mortality.

Keywords: fetomaternal transfusion, decreased fetal movements, hydropsfetalis, anemia, congestive heart failure.

GJMR-E Classification: NLMC Code: WP 400

Strictly as per the compliance and regulations of:

Fetomaternal Hemorrhage - A Mystery Entity

Maria Zormpa [α] & Dr. Alfred Schleiss [σ]

Abstract- Fetomaternal hemorrhage is a well - recognised cause of neonatal morbidity. The diagnosisis not easy to make as the clinical symptoms if present, can be very subtle. There are diagnostic tests, as the rosette screen and Kleihauer-Betke test that can confirm the cinical suspicion and typical prenatal ultrasound signs and pathologic allaboratory results at delivery that confirm the underlying pathophysiology of the condition.

We have gone through the upto date literature and present the latest findings on fetomaternal hemorrhage. However, more studies need to be carried out to shed light to other risk factors, clinical and laboratory data associated with the disease, to decrease the fetal and perinatal morbidity and mortality.

Keywords: fetomaternal transfusion, decreased fetal movements, hydropsfetalis, anemia, congestive heart failure.

I. Introduction

The entrance of small quantity of fetal red cells into the maternal circulation during or before delivery is commonplace in all pregnancies. However, a blood loss of more than half of fetal blood volume is rare and can potentially lead to severe neonatal anemia and death up to 0.04% of all births[1,2]. Usually the cause is idiopathic and happens in low-risk late pregnancies[3,4].

Fetomaternal hemorrhage can take place early in pregnancy because of disorders of the placental circulation. About half of mothers have detectable fetal red cells in their circulation of a very small amount[5]. Volumes in the range of 10-150 ml can be associated with FMH[6,7]. Amount exceeding 150 ml happens in a very small number of pregnancies and the severity of FMH can be assessed by the quantity of fetal cells in the maternal circulation[8].

Known incipitating factors of fetomaternal hemorrhage include placental abruption, vasa previa, amniocentesis, chorionic villous sampling, external cephalic version, choriocarcinoma[8]. In addition, Rhesus alloimmunization has been identified as a possible cause of fetomaternal hemorrhage[9]. In that case, Rhesus + fetal cells sensitize Rhesus - maternal cells resulting in alloantibody production. This in turn can lead to hemolytic disease of the newborn (HDN)[10]. The rates of such complications are very low due to Rhesus screening and immunoprophylaxis. However in up to 82% of cases of fetomaternal hemorrhage no causative agent can be identified[11].

Author α: M.D., Junior Consultant, Department of Obstetrics and Gynecology, Hospital of Muri, Switzerland, Spitalstrasse 144, 5630 Muri, Switzerland. e-mail: mariazormpa7@gmail.com

Author σ: M.D., Obstetrician-Gynecologist, Chief of the Department, Hospital of Muri, Switzerland, Spitalstrasse 144, 5630 Muri, Switzerland.

There are specialised tests that can confirm the presence of fetomaternal bleeding. The rosette screen can detect small quantities of fetal blood in the maternal circulation and the Kleihauer-Betke test remains the method of choice that can confirm the diagnosis and quantify the amount of fetal cells[12,13,14]. Moreover flow-cytometry can also assist in the detection of fetal cells but has no increased sensitivity in comparison to KB[15]. In early pregnancy a sensitive marker supporting FMH is increased alfa fetoprotein (AFP). Later on, the diagnosis of FMH can be supported by both increased AFP and a positive Kleihauer-Betke test[16].

The clinical picture can vary greatly. Fetomaternal hemorrhage can manifest as decreased fetal movements without an association with abdominal injury, pain or bleeding[17]. Abnormal CTG tracings can be discovered accidentally with decreased variability, variable or late decelerations[18,19]. Ultrasound findings include intraventricular hemorrhage, pleural and pericardial effusion and ascites[20,21] (Fig. 1, 2 & 3).

The child can suffer from severe respiratory depression and hepatomegaly or subcutaneous edema as a consequence of congestive heart failure[22,23,24]. Additionally, possible complications include neurological sequelae, for example spastic cerebral palsy and stillbirth[25,26]. The laboratory results at delivery may include increased reticulocyte number suggestive of chronic blood loss, deranged coagulation and liver enzymes and hematuria[27] (Table 1).

Table 1: Laboratory Results

Parameter	Value	Normal Range
Hemoglobin (Cord Blood) g/dl	3.4	16.8
Reticulocytes (%)	8.6	3 - 7
Platelets 10*9/L	105	290
Prothrombin Time Sec	38	10 - 12.4
APTT Sec	60	30 - 55
INR	3.20	0.9 - 1.07
Fibrinogen g/l	0.8	1.6 - 3.5
ALAT IU/L	308	0 - 30
ASAT IU/L	1534	0 - 30
Albumin g/l	14	27 - 43
Protein g/l	24	45 - 72

The management of fetomaternal hemorrhage can also be complicated. In early pregnancy intrauterine transfusion may be attempted to correct the anemia but in cases of continuous bleeding, repeat transfusions or delivery may be indicated[28].

Although massive fetomaternal hemorrhage is a rare condition, it is possibly under diagnosed because of the lack of clinical suspicion[10]. With fetomaternal hemorrhage being an etiology of serious fetal morbidity and mortality, further research is essential for avoiding significant complications.

Financial
Disclaimer.

Conflict of Interest
None.

References Références Referencias

1. Kosasa T. S, Ebesugawa I, Nakayama R. T, Hale R. W. Massive fetomaternal hemorrhage preceded by decreased fetal movement and a nonreactive fetal heart rate pattern. Obstet Gynecol 1993. 1. Kosasa Oct: 82 (4 Pt 2) (Suppl): 711-714.
2. Heise R. H, Van Winter J. T, Ogburn P. L., Jr Identification of acute transplacental hemorrhage in a low-risk patient as a result of daily counting of fetal movements. Mayo Clin Proc 1993. Sep: 68(9): 892-894.
3. De Almeida V, Bowman J. M. Massive fetomaternal hemorrhage: Manitoba experience. Obstet Gynecol 1994. Mar: 83(3): 323-328.
4. Fliegner J. R, Fortune D. W, Barrie J. U. Occult fetomaternal haemorrhage as a cause of fetal mortality and morbidity. Aust N Z J Obstet Gynaecol 1987. May: 27(2): 158-161.
5. Pauli R. M. Fetomaternal hemorrhage and still birth. Newsletter of Wisconsin Still birth service program, 1993 Vol 1, N. 3.
6. Rubod C, Deruelle P, Le Goueff F, Tunez V, Fournier M, Subtil D. Long-term prognosis for infants after massive fetomaternal hemorrhage. Obstet Gynecol 2007. Aug: 110 (2 Pt 1): 256-260.
7. Sebring E. S, Polesky H. F. Fetomaternal hemorrhage: incidence, risk factors, time of occurrence, and clinical effects. Transfusion 1990. May: 30(4): 344-357.
8. Ahmed M, Abdullatif M. Fetomaternal Transfusion as a Cause of Severe Fetal Anemia Causing Early Neonatal Death: A Case Report. Oman Med J. 2011 Nov: 26(6): 444-446.
9. Kim Y. A, Makar R. S. Detection of fetomaternal hemorrhage. Am J Hematol. 2012 Apr: 87(4): 417-23.
10. Wylie B. J, D'Alton M. E. Fetomaternal hemorrhage. Obstet Gynecol 2010: 115: 1039-51.
11. Giacoia G. P. Severe fetomaternal hemorrhage: a review. Obstet Gynecol Surv 1997. Jun: 52 (6): 372-380.
12. Polesky H. F, Sebring E. S. Evaluation of methods for detection and quantitation of fetal cells and their effect on RhIg G usage. Am J Clin Pathol 1981: 76 (4 Suppl): 525-529.
13. Stedman C. M, Baudin J. C, White C. A, Cooper E. S. Use of the erythrocyte rosette test to screen for excessive fetomaternal hemorrhage in Rh-negative women. Am J Obstet Gynecol 1986: 154: 1363-1369.
14. Bayliss K. M, Kueck B. D, Johnson S. T, Fueger J. T. Detecting fetomaternal hemorrhage: A comparison of five methods. Transfusion 1991: 31: 303-307.
15. Katiyar R, Kriplani A, Agarwal N, Bhatla N, Kabra M. Detection of fetomaternal hemorrhage following chorionic villus sampling by Kleihauer Betke test and rise in maternal serum alpha feto protein. Prenat Diagn 2007. Feb: 27(2): 139-142.
16. Hay D. L, Horacek I, Paull J. Evaluating fetomaternal hemorrhage by alpha fetoprotein and Kleihauer following therapeutic abortions. Department of Pathology, The Royal Women's Hospital, Melbourne, Australia Department of Anaesthetics, The Royal Women's Hospital, Melbourne, Australia. Received 18 May 1981: accepted 13 July 1981. Available online 10 April 2004.
17. Laube D. W, Schauberger C. W. Fetomaternal bleeding as a cause for "unexplained" fetal death. Obstet Gynecol 1982. Nov: 60 (5): 649-651.
18. Lau M. S, Tan J. V, Tan T. Y et al. Idiopathic chronic fetomaternalhaemorrhage resulting in hydrops - a case report. Ann Acad Med Singapore. 2003 Sep: 32 (5): 642-4.
19. Place J. C, Plano L. R. A Case Report of Decreased Fetal Movement during Fetomaternal Hemorrhage. J Obstet Gynecol Neonatal Nurs. 2015 Nov-Dec: 44 (6): 737-42.
20. Lionnet C, Body G, Gold F, Paillet C, Vaillant M. C, Alle C, et al. Fetal cerebral accident due to massive fetomaternal hemorrhage. A case report. J Gynecol Obstet Biol Reprod (Paris) 1995: 24 (5): 553-556.
21. Dardwell M. S. Ultrasound diagnosis of abruptio placentae with fetomaternal hemorrhage. Am J Obstet Gynecol. 1987 Aug: 157 (2): 358-9.
22. Naulaers G, Barten S, Vanhole C et al. Management of severe neonatal anemia due to fetomaternal transfusion. Am J Perinatol. 1999: 16 (4): 193-6.
23. Arcasoy M. O, Gallagher P. G. Hematologic disorders and nonimmune hydrops fetalis. Semin Perinatol. 1995 Dec: 19(6): 502-15.
24. Pusch H, Rosegger H. Fetomaternal blood transfusion as a cause of severe obstetrical

complications. Geburtshilfe Frauenheilkd. 1985 Oct: 45 (10): 737-8.
25. Kadooka M, Kato H, Kato A et al. Effect of neonatal hemoglobin concentration on long-term outcome of infants affected by fetomaternal hemorrhage. Early Hum Dev. 2014 Sep: 90 (9): 431-4.
26. Ravishankar S, Migliori A, Struminsky J et al. Placental findings in feto-maternal hemorrhage in livebirth and stillbirth. Pathol Res Pract. 2017 Apr: 213 (4): 301-304.
27. Sainio S, Javela K, Tuimla J et al. Usefulness of maternal anti-HPA-1a antibody quantitation in predicting severity of foetomaternal alloimmune thrombocytopenia. Transfus Med. 2013 Apr: 23 (2): 114-20.
28. Stefanovic V. Fetomaternal hemorrhage complicated pregnancy: risks, identification, and management. Curr Opin Obstet Gynecol. 2016 Apr: 28 (2): 86-94.

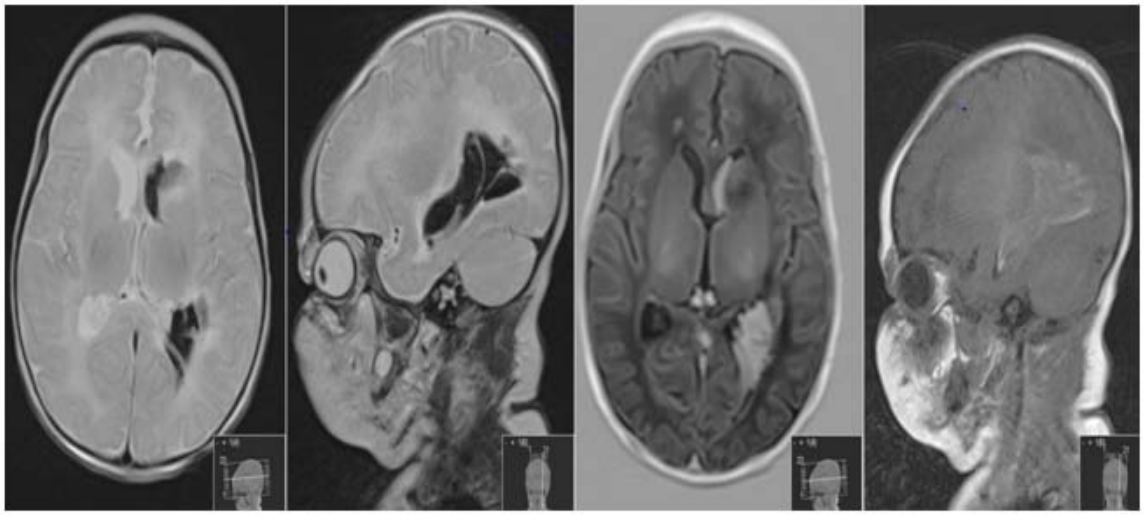

Fig. 1: MRI, Sagittal view showing Intraventricular Hemorrhage

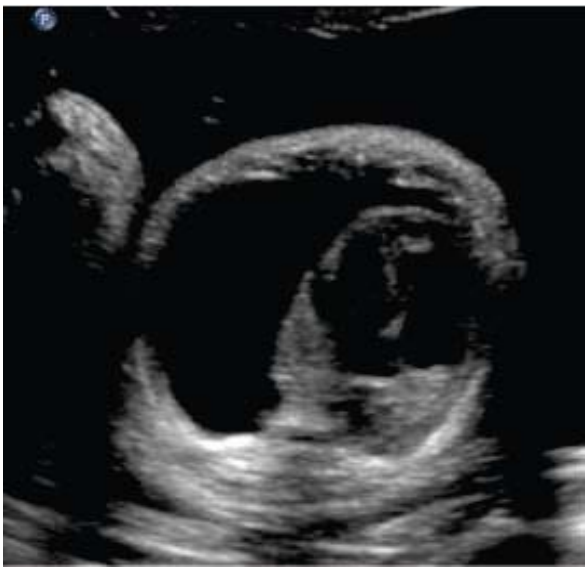

Fig. 2: US showing Pleural Effusion

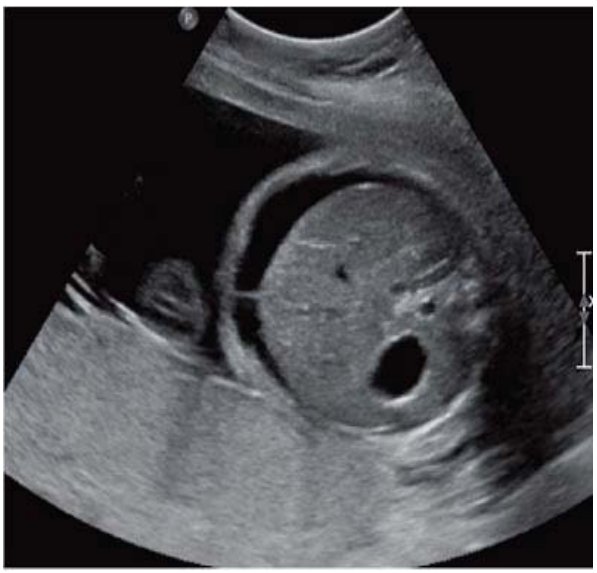

Fig. 3: US showing Ascites