

Hypofibrinogenemia in Abruptio Placenta

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Hemorrhage is one of the chief causes of maternal mortality in this country. The disastrous dissolution of the blood-clotting mechanism in abruptio placenta is a frequent cause of this condition.

As early as 1901, DeLee described a hemophilic-like condition of the blood in abruptio. Dieckmann in 1936, studying a group of patients with abruptio, found fibrinogen concentration below the normal levels in seven out of eleven cases, and in three where the fibrinogen level was below 50 mg./100 c.c. During the past few years hypofibrinogenemia has been shown to exist in other conditions apart from abruptio, such as, fetal death in utero due to isosensitization to Rh, and fetal retention, amniotic fluid embolus, severe eclampsia, abortion and retained placenta.

In a recent study undertaken at the John Hopkins University School of Medicine, ten cases of fibrinogenopenia complicating pregnancy were examined. Seven of these ten were associated with abruptio placenta and only two of these seven showed any evidence of hypertensive toxemia—these two only to a minor degree. This would suggest that there is no direct relationship between fibrinogenopenia and toxemia of pregnancy. There were no cases of afibrinogenemia, however in most cases the degree of depression of fibrinogen was severe when we con-

sider that the level is greater in pregnancy than that found in the non-pregnant state. An observation of significance in these cases was that in six of the seven studied, a thrombocytopenia was found. In the one instance where the platelet count was normal, the bleeding was not a serious problem, even when the woman was delivered by cesarean section. In addition, another defect of the coagulation mechanism—in the form of a deficiency of prothrombin was demonstrated in five of the seven cases. All the other clotting factors tested were found to be normal.

At present, it can be stated, that although a definite coagulation defect is known to exist, the etiology of this deficiency if it is such, remains unsettled. There are however, three possibilities:

1. **The production of fibrinogen may be retarded.** However this seems unlikely since there are almost no other abnormalities of liver function demonstrable in these patients, and the rapid recovery that follows evacuation of the uterus would seem to be against this. The thrombocytopenia would also be difficult to explain on this basis.
2. **Destruction of fibrinogen** might also account for the fibrinogenopenia. However although it has been stated that the detection of fibrinolysin by simply observing the clot formation

and the subsequent dissolution of the clot in less than twenty-four hours in a test tube, is an easy procedure, yet many authors do not believe this to indicate the presence of lysins. This apparent liquefaction of the blood clot has been interpreted erroneously as indicating fibrinolysis. A more plausible explanation for the phenomenon is that in the presence of very low fibrinogen levels, the clot is "weak" and unable to hold together the masses of red blood cells. Also, clot retraction is a function of platelets, fibrinogen and red blood cell level. Thus, despite thrombocytopenia, clot retraction is still possible. Hence, although fibrinolysins have been demonstrated by some authors (1-2), others have been unable to detect increased fibrinolysins (3-4).

3. The third possible mechanism for the production of fibrinogenopenia is that of an increased utilization of fibrinogen. Here, let us look for a moment at this very modest explanation of the clotting mechanism.

Ca. + Thromboplastic + Prothrombin → Thrombin.
Thrombin + Fibrinogen → Fibrin

It has been shown quite a few times (5-6-7) that the intravenous infusion of thromboplastin at an appropriate rate results in a marked depletion of fibrinogen in the experimental animal. A simultaneous decrease of prothrombin (4-6) Agglobulin (4) and platelets (4) were also described in some of these experiments. It has also been shown that extracts of placental tissue (8) and amniotic fluid (8) possess thromboplastic activity, and a possible entry of such substances into the maternal circulation has also been demonstrated (9). Therefore, a likely explanation of the defect is an increased utilization of fibrinogen, resulting from intravascular defibrinogenation of the mothers' blood due to the entry of thromboplastic substances from the uterine contents into the maternal circulation.

Summary:

Speed is essential in the treatment of hypofibrinogenemia in order to prevent fatal changes in vital organs due to hemorrhage. A satisfactory method of treatment is available to all as commercially prepared fibrinogen is now available. In all cases of abruptio, and in all cases of non-obvious bleeding in a pregnant woman, hypofibrinogenemia must be considered.

References:

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DALHOUSIE UNIVERSITY MEDICAL POST-GRADUATE PROGRAMME

The Post-Graduate Committee of the Faculty of Medicine of Dalhousie has arranged an extensive program for the current season intended to assist the general practitioner in keeping up-to-date in newer concepts in the practice of medicine and to provide a practical means of acquiring a concentrated review.

A number of distinguished guest lectures will be participating in several of the courses and each speaker is requested to give an evening lecture. It is hoped that all who can will avail themselves of the opportunity of hearing these outstanding teachers.

The following short courses are scheduled to be held in Halifax:

November 28th—December 2nd, 1955	Week in Obetetrics, Gynaecology and Paediatrics
January 30th, 31st and Feb. 1st, 1956	Three Days in Psychiatry
	Short course in Anaesthesia
March 26th—30th, 1956	Week in Medicine featuring Rheumatism and Arthritis and Neurology
Guest Teacher:	Dr. Donald Graham and Dr. John Prichard
April 9th and 10th, 1956	Symposium in Dermatology
Guest Teacher:	Dr. L. P. Ereaux
April 23rd—27th	Week in Surgery
Guest Teacher:	Dr. M. M. Hoffman
May 7th—9th	2½ days in Obstetrics and Gynaecology
May 9th—11th	2½ days in Paediatrics

In addition to thes courses two Regional Courses are being conducted in Bridgewater and New Glasgow consisting of six consecutive evening sessions. In one case a program covering obstetrics, Gynaecology and Paediatrics was chosen and in the other course the program is widely diversified. Faculty members also take part in the program at a number of hospital and medical soceity monthly of quarterly meetings.