



Lecture title: Hemostasis and Coagulation of Blood

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Summary:

Induced or spontaneous hemorrhage is halted by the process of hemostasis Three **principle factors** are involved in hemostasis.

1-Vascular factors , e.g., integrity of blood vessel walls.

2-Thrombocytes.

3-Clotting mechanism.

Coagulation time :

The whole blood clotting time can be determined by several techniques.

1-A-Lee- White Coagulation time

*To collect blood for a-Lee-White Coagulation time .

*Rinse a sterile syringe and needle with sterile physiologic saline solution.

*The saline should be carefully expelled so that the dead space in the end of the barrel and needle remains filled.

*More than 3 ml of blood should be collected and blood clotting time should be recorded from the moment that blood first appears in the syringe.

*Every attempt should be made to avoid introduction of air into the syringe, as air will hasten coagulation.

*The needle is removed from the syringe.

*1 ml of blood is placed in to each of three tube.

*These tube should be chemically clean and rinsed with physiological saline solution just before use. *Before the addition of blood , the tubes should be placed in to a container of water that is maintained at 37C°.

*The tubes are tilted at 30- second intervals starting with tube 1; when this clots.



*Proceed to tubes 2 and 3 respectively.

*Be careful not to allow the tubes to cool or to gettable the blood to excess until coagulation has occurred. *Clotting time is recorded when the tube can be inverted without spilling the contents. *The endpoint is reached when the blood in tube three has coagulation.

*Coagulation time is measured from the moment the blood sample is obtained until coagulation is completed in tube three.

B- An alternative method for standing clotting time employs four test tubes, two of which are glass and two of which Silicone coated glass or plastic.

*One milliliter of blood , collected as just described, is placed in each of the four tubes, and coagulation is timed.

*Clotting time in plastic or silicone tubes is approximately twice as long as it is in glass tubes.

2-Capillary tube Method

*A simple technique for determining whole blood coagulation time is the capillary tube method.

*The skin is punctured ,the first drop of blood is wiped away, and capillary tube is filled with blood . it is important to note the time when blood first appears in the capillary tube.

*Holding the tube between the thumb and index finger of both hands, gently break off small pieces every 30 seconds until a strand of fibrin is seen extending across the gap between the two broken ends of the tube.

*The interval between the appearance of blood and the appearance of a fibrin strand is the coagulation time . this techniques is simpler to perform and less time consuming than the Lee- White method.

Normal values of Coagulation Time

Horse 3-15 min

Cattle 2.5-15 min

Sheep 1-6 min

Goat 2.5-11.5 min

Dog 3-4 min



Interpretation of Coagulation Time

*prolonged whole blood clotting time is seen in a variety of coagulopathies in domestic animals. Included are the following conditions:

- 1.Fibrinogen(factor 1)deficiency.
- 2.Hemophilia A(factor VIII deficiency).
- 3-Hemophilia B(factor IX deficiency).
- 4-Von Will brands disease(clotting time may also be normal in this disorder).
- 5-Severe liver disease.
- 6- Vitamin K deficiency.
- 7-Advanced stage of DIC.
- 8-Thrombocytopenia (if test conducted in siliconized or plastic tubes).
- 9-The presence of circulating anticoagulants).
- 10-Uremia (occasionally).

References:

Coles ,E.H. (1968) Veterinary Clinical Pathology. WB Saunders Company Philadelphia and London,