



STRIP ELUTION TECHNIC FOR DELAYED HEMOGLOBIN DETERMINATION

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ABSTRACT.

A simple method of delayed hemoglobin determination utilizing filter paper strip elution technic is described. Twenty microliter of blood sample is transferred from Sahli hemoglobin pipette on to the filter paper strip. The latter is subsequently immersed in 5 ml. of Drabkin's solution for 30 minutes and the hemoglobin content of the solution is measured spectrophotometrically. The blood sample is stable up to 5 weeks or longer period of storage. It has proved its feasibility and usefulness for field work.

INTRODUCTION.

In addition to the need for a rapid and accurate method of clinical hemoglobinometry, there may occasionally be a requirement for a convenient mean for delayed determination of hemoglobin. The latter would be useful in certain field investigations, epidemiological surveys, as well as when one wish to store a patient's blood for a later determination in a clinical laboratory.

We are reporting our experience with the simple, filter paper strip elution technic for delayed hemoglobin determination and its usefulness in the field work.

MATERIALS AND METHOD.

A volume of 20 cu. mm. blood was taken up into a Sahli hemoglobin pipette then carefully transferred on to one end of a filter paper strip (Whatman No. 1 or 2, 12x60 mm. size). It was allowed

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to dry in room temperature for about 30 minutes then was kept in the plastic bag or container. Later, this filter paper strip was placed in the test tube containing 5 ml. of Drabkin's solution. The hemoglobin content of the solution was measured by a standard spectrophotometric technic.

RESULTS.

I. Elution time of blood from the filter paper. The filter paper strips with blood samples were placed in separate test tubes with Drabkin's solution. The hemoglobin content of the solution were estimated at varying intervals. The results obtained (see Figure) indicated that complete elution of blood occurred at 30 minutes. Frequent shaking of the strips or the test tubes enhances the elution rate but the excessive shaking may cause the undesirable turbidity of the solution. This is the result of the dissolution of the filter paper strip and requires adequate centrifugation before the hemoglobin content is estimated. Adequate elution of the blood sample is also obtained when the filter paper strip was left in the Drabkin's solution for 30 minutes without shaking.

II. Effect of storage condition. Filter paper strips with blood samples were kept in the closed container (with minimal exposure to bright light) at varying periods of time up to 26 days in either the freezer ($-20^{\circ}\text{C}.$), ice box (0 to $4^{\circ}\text{C}.$),

room temperature ($25-28^{\circ}\text{C}.$) and in the car ($10-45^{\circ}\text{C}.$). Each blood sample was eluted for 30 minutes in Drabkin's solution before the hemoglobin content was measured. The results obtained indicated that:

- a. The hemoglobin values obtained from blood samples kept in different temperature and condition were identical.
- b. The hemoglobin values remained constant during the 36 days of storage.

The most interesting result observed is the stability of hemoglobin values throughout the test period of 36 days. It may be stable as long as 6 months or longer when it is kept away from light.

III. Stability of blood from the patients with different type of anemia. blood samples obtained from patients with Thalassemias, leukemias, Aplastic anemias, G-6-PD deficiency etc. had shown the stability similar to normal blood.

COMMENTS.

The elution of hemoglobin from the filter paper strip is completed at 30 minutes similar to previous experience. (1) It is recommended that the elution required only minimal shaking. Centrifugation is needed only to eliminate the turbidity resulting from an excessive agitation. Searcy et al (2) stated that the hemoglobin value decreases 1.0 to 1.5 gm./100 ml. after several weeks of storage. Sundharagati (1) cautioned that the hemoglobin value decreases gradually after 10 days of storage.

Our results are in variance with previous reports and indicated that the hemoglobin value of blood sample is constant for a period of 5 weeks or longer if it is being kept away from the bright light. (3) Although our experiment was terminated after 5 weeks period, there is indication that the hemoglobin value of the stored blood sample can be recovered at a much longer time. We have now utilized this technic on over 600 individuals during the field survey of the hill tribes with satisfactory results.

CONCLUSION.

A simple method for delayed hemoglobin determination using filter paper elution technic is described. The blood sample can be kept at different temperatures without deleterious effects up to 5

weeks providing that it is kept away from the bright light, It is useful especially for field survey purpose.

REFERENCES.

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Guarantee is not in variance with previous reports and indicated that the hemoglobin value of blood sample is constant for a period of 2 weeks or longer. It is suggested that the bright light is a useful especially in field survey purposes.

