



ASCLS Continuing Education

Clinical Lab Investigations: Case Studies for the Lab Professional Case set #2 – Immunology/Immunohematology – HDN Hemostasis – Protein C Deficiency

Final Quiz

Select the single best answer for each of the following multiple-choice questions and record on the answer sheet.

1. Which of the following causes is LEAST likely to explain the apparent discrepant results observed in this case study?
 - a. Rh type HDN
 - b. Other type HDN
 - c. Clerical error
 - d. Technical error

2. The first step a CLS should take when attempting to resolve discrepant results like those presented in this case study would be to:
 - a. Collect and test a new sample
 - b. repeat the tests on the same sample
 - c. ascertain appropriate operation of centrifuge/cell washer
 - d. perform additional testing to determine cause of discrepant results

3. Assuming that the sample was properly collected and labeled and technical errors have been ruled out, the CLS should perform:
 - a. an antibody screen on a sample of paternal serum/plasma
 - b. liver function tests on the twins to rule out liver disease
 - c. a DAT on the mother's red cells to rule out an autoimmune process
 - d. an antibody identification procedure on an eluate from the twins' red cells

4. Which of the following units of blood would be MOST appropriate for exchange transfusion of these twins if indicated?
 - a. Group O Rh positive, hemoglobin S positive, 3 days old, leukoreduced
 - b. Group O Rh positive, hemoglobin S negative, 21 days old, not leukoreduced
 - c. Group O Rh negative, hemoglobin S negative, 40 days old, leukoreduced
 - d. Group O Rh negative, hemoglobin S negative, 5 days old, leukoreduced

5. The BEST explanation for the failure to detect the positive antibody screen in this mother is:
 - a. avidity of this particular antibody
 - b. quantity of antibody in maternal plasma
 - c. absence of antigen from screening cells
 - d. use of an inappropriate enhancement media

6. The patient was diagnosed with protein C deficiency. Protein C is dependent upon which one of the following for normal activity?
 - a. Na⁺
 - b. K⁺
 - c. Ca⁺⁺
 - d. Vitamin K

7. Protein C inactivates which coagulation (co-factors) factors?
 - a. VI and V
 - b. V and VIII
 - c. VIII and IX
 - d. V and VII

8. Which components complex together to help activate Protein C?
 - a. Thrombomodulin and protein S
 - b. Thrombomodulin and C4b-BP
 - c. Thrombomodulin and thrombin
 - d. Protein S and thrombin

9. The patient's deficiencies in protein C most likely stemmed from which combination?
 - a. Acquired and heterozygous
 - b. Inherited and homozygous
 - c. Acquired and homozygous
 - d. Inherited and heterozygous

10. The decrease in the number of symptomatic patients with heterozygous gene inheritance is thought to be due to all of the following EXCEPT
 - a. Hypercholesterolemia
 - b. Factor V leiden mutation
 - c. Homocysteinemia
 - d. Increased factor VIII

11. Testing for the presence of protein C is done by which one of the following method principles?
 - a. Immunologic (Ab)
 - b. Immunologic (Ag)
 - c. Functional (Ag)
 - d. Functional (Ab)

12. Testing for the activity of protein C is done by which one of the following method principles?
 - a. Immunologic (Ab)
 - b. Immunologic (Ag)
 - c. Functional (Ag)
 - d. Functional (Ab)

13. Testing methods for protein C antigen and functional protein C include all of the following EXCEPT
 - a. ELISA
 - b. HPLC
 - c. Laurell rocket immuno-electrophoresis
 - d. clot-based or synthetic chromogenic substrates

14. Which of the following drugs would be a typical life long therapy for a patient that had a significant clotting episode without predisposing factors?
- a. Heparin
 - b. Enoxaparin
 - c. Warfarin
 - d. Lamivudine
15. Warfarin functions as an anticoagulant by which method?
- a. Inhibiting the recycling of vitamin K
 - b. Increasing the dietary absorption of vitamin K
 - c. Directly increasing the rate of carboxylation of Protein C
 - d. Inhibiting the formation of the thrombomodulin-thrombin complex

Record all answers on the answer sheet. Detach and mail or fax your answer sheet.

Faxed forms only accepted with credit card payment.

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Sherry Miner
ASCLS PACE Coordinator
720 West Main
Rochester, IL 62563
Fax) 217- 498-2075

ASCLS Continuing Education Answer Sheet

Clinical Lab Investigations: Case set #2 – HDN & Protein C Deficiency



Multiple Choice Questions

Circle the single best answer for each question:

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D

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Program/Session Title: Clinical Lab Investigations: Case set #2 – HDN & Protein C Deficiency

Date Completed:

Program Number: 015-621-07

Use this form to evaluate the above titled session. Circle the number (1-low, 5-high) to indicate your ratings of this program, objectives, and speaker; use one response per line. Please complete this form to fulfill the session requirements.

AUTHOR RATING	Low/Poor	High/Excellent	Not Applicable
To what extent: Did the authors present a knowledgeable, organized and concise case study?	1 2 3 4 5		N/A
Did the authors clarify and focus on the stated objectives?	1 2 3 4 5		N/A
Were the presentation methods & graphic information appropriate & effectively used?	1 2 3 4 5		N/A

OBJECTIVES RATING	Low/Poor	High/Excellent	Not Applicable
To what extent was each objective achieved?			
1. Explain the discrepancy indicated by the maternal sample and cord blood testing.	1 2 3 4 5		N/A
2. Discuss possible explanations for the anomalous results.	1 2 3 4 5		N/A
3. List and explain the additional testing that should be performed to help resolve this discrepancy and possible treatment.	1 2 3 4 5		N/A
4. Explain the normal role of Protein C and its effects when it is deficient.	1 2 3 4 5		N/A
5. Discuss the difference between Type I and Type II Protein C Deficiency and which laboratory testing is useful to diagnose the disorder.	1 2 3 4 5		N/A
6. State the most common form of treatment for a Protein C Deficiency.	1 2 3 4 5		N/A

CONTENT RATING	Low/Poor	High/Excellent	Not Applicable
To what extent did the content relate to each case study's objectives?	1 2 3 4 5		N/A
Rate the contribution of reading this case study to your overall knowledge of these subjects.	1 2 3 4 5		N/A
Rate your overall degree of satisfaction with this activity.	1 2 3 4 5		N/A
Rate your level of expertise in these subjects prior to reading this case study.	1 2 3 4 5		N/A
Comments:			

**Return completed form with answer sheet to: Sherry Miner, ASCLS PACE Coordinator, 720 West Main,
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