ISSUE
09
January
2021

QSP Monthly

HORIBA Medical

NEWSLETTER OF THE QUALITY SLIDE PROGRAM

This issue

Last Month's Slides

December 2020 Slide Summaries

Slide 1
Film morphology shows large granular lymphocytes. Raised MCHC possible presence of cold agglutinins. Compare results with cytogenetics and other clinical results.

Slide 2
Abnormal WBC differential, thrombocytopenia and alarms on analyser. Acute B-lymphoblastic leukaemia. Blast population estimated at 79% of leucocytes.

Slide 3
Thrombotic thrombocytopenia purpura (TTP), due to alcohol binging. Morphology shows schistocytes, RBC fragments and helmet cells.

Slide 4
Generally normal film

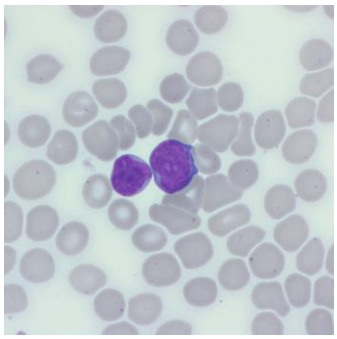
Slide 5
Generally normal film

Slide 6
Multiple alarms on the analyser. >WBC, presence of blasts. 58% Blastosis.

Monthly Digital Case study
Slide 2

Presentation

Female 80 years old,
Alarms on analyser : WBC Diff abnormal and thrombocytopenia. Acute B Lymphoblastic Leukaemia at diagnosis. Comment on the report: Blast population estimated at 79% of leukocytes. Expert comment: Positive Philadelphia chromosome
Query presence of rare granular blasts.



FBC Results

WBC	**43.0 (10^3/mm3)**
RBC	**4.13 (10^6/mm3)**
HGB	**12.7 (g/L)**
HCT	**37.6 (%)**
MCV	**91 (fL)**
MCH	**30.8 (pg)**
MCHC	**33.8 (g/dL)**
PLT	**41 (10^3/mm3)**

Neutrophils	**13 %**
Lymphocytes	**8.3 %**
Monocytes	**0.9 %**
Eosinophils	**0.9 %**
Basophils	**0.0 %**

Slide review

Acute B Lymphoblastic Leukaemia at diagnosis.
Comment on the report**:** Blast population estimated at 79% of leukocytes.
Expert comment: Positive Philadelphia chromosome, query presence of rare granular blasts.

Diagnosis

Acute B Lymphoblastic leukaemia.

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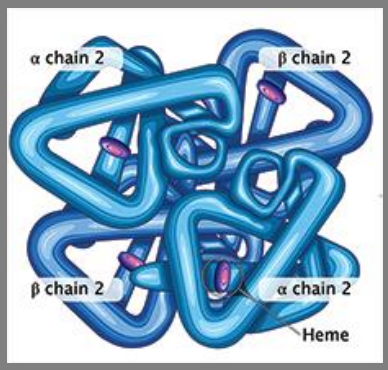
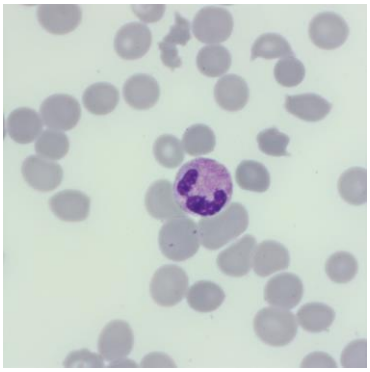
Monthly Morphology Quiz

Who first discovered Haemoglobin?



Haemoglobin Molecule

For last month's crosswords answers, please see in the end of the newsletter



QSP case 3 slide showing red cell fragments

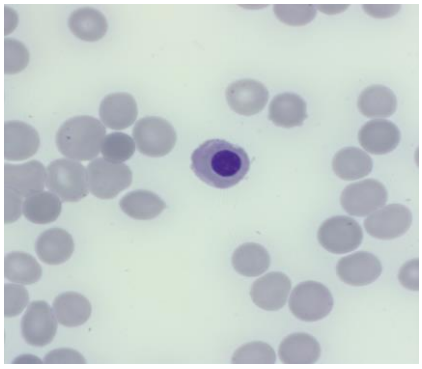
Thrombotic Thrombocytopenic Purpura (TTP)

An overview of the clinical features, laboratory findings and treatment

Introduction

Thrombotic thrombocytopenia purpura (TTP) is an acute disorder characterised by thrombocytopenia and mircoangiopathic haemolytic anaemia.

Clinical Presentation



QSP case 3 slide showing red nucleated RBC

03 December 2020
Female (53 years old)
WBC 20.8* (10^3/mm3)
RBC 2.24* (10^6/mm3)
HGB 7.7* (g/dL)
HCT 23.8* (%)
MCV 106 (fL)
MCH 34.4 (pg)
MCMH 32.4 (g/dL)
PLT 9* (10^3/mm3)
Thrombotic thrombocytopenic purpura due to alcohol binge drinking.

Laboratory Findings

Several tests to confirm TTP will follow in patients suspected and showing symptoms of thrombocytopenia and anaemia. Tests include urinalysis, blood film, reticulocyte count, serum LDH, haptoglobin, renal function. ADAMTS13 activity, inhibitor assays and serum bilirubin (both direct and indirect).

Confirmed diagnosis would be indicated by:

- Thrombocytopenia and anaemia
- Blood film showing fragmented red blood cells, indication of microangiopathic haemolysis- schistocytes, helmet cells, distorted red cells
- A negative antiglobulin test
- Normal coagulation screen

ADAMTS13 testing is carried out to determine activity and presence of an autoantibody. Although initial treatment should always commence, the resulting ADAMTS13 test can guide as to subsequent treatment. An ADAMTS13 level of <10% with the presence of antibody against ADAMTS13 is normal for adults with TTP, and these patients would respond to a plasma exchange and immunosuppressants (see below).

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Treatment and Prognosis

Treatment of TTP includes Plasma exchange, corticosteroids, rituximab and very occasionally caplacizumab.

An untreated thrombocytopenia purpura is almost always fatal. A plasma exchange has a very successful recovery rate of >85%. The exchange would be started urgently and continue daily until results suggest the disease activity has subsided, i.e., a normal platelet count. Adults with TTP are also often prescribed corticosteroids and rituximab.

Calpacizumab, which is an anti-von Willebrand factor single-variable-domain immunoglobulin, acts by inhibiting the interaction between the unusually large von Willebrand factor multimers and platelets. Calpacizumab appears to hasten resolution of the thrombocytopenia but can also increase bleeding tendency of the patient.

Generally, patients will only experience one episode of TTP. However, relapses occur in roughly 40% of patients who do have a severe deficiency in ADAMTS13 activity, due to an autoantibody inhibitor to ADAMTS13. If relapse occurs, more intense immunosuppression using rituximab may be effective. Patients must be evaluated promptly if relapse is suspected.

Summary

Platelets are destroyed non-immunologically by microvascular thrombi, resulting in thrombocytopenia, anaemia and organ ischemia.

The cause is a deficiency of the ADAMTS13 protease, commonly due to an acquired autoantibody, but rarely because of an inherited gene mutation.

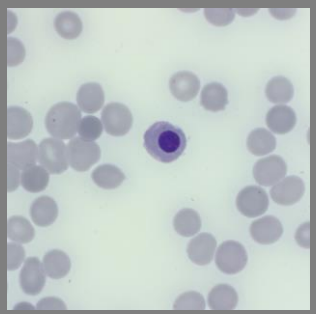
Morphological features include schistocytes, helmet cells, spherocytes and Nucleated red cells.

Untreated TTP is usually fatal. Efficient treatment with plasma exchange together with corticosteroids and rituximab results in good survival rates.

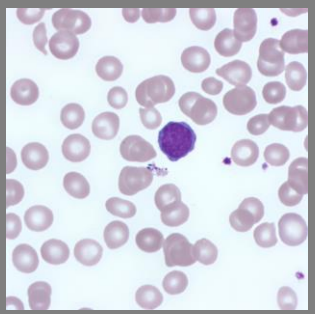
This Month's Top Morphology Tip

Nucleated RBC's or Lymphocytes??

Nucleated red cells and lymphocytes can sometimes be mistaken. Key characteristics too look out for are: The lymphocyte has a viable nucleus with clumpy to blocky chromatin, whereas the nRBCs have pycnotic nuclei with condensed homogenous chromatin. Cytoplasm colour: The lymphocyte has a blue cytoplasm whereas the nRBC have a cytoplasm the colour of mature erythrocytes (red) or immature polychromatophils (purple). Nucleated reds can be larger than the lymphocyte, but is dependent on the stage of development of the red cell.



Nucleated Red Cell



Lymphocyte

Other News

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Bilbliography

Hoffbrand's Essential Haematology 7th Edition Ch.20. Wiley Blackwell 2015

ADAMTS13 gene, Medline Plus

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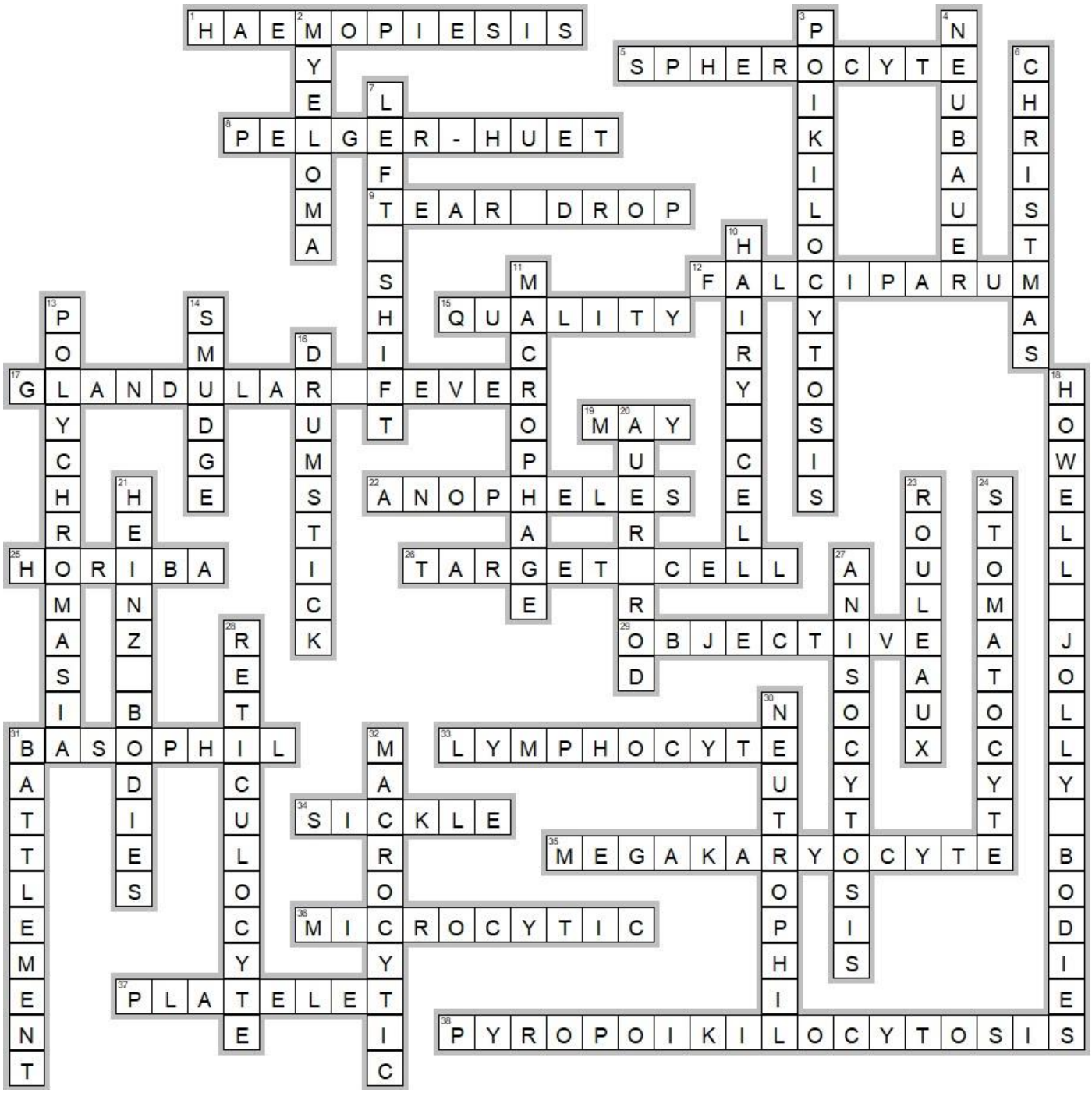
QSP Newsletter crossword answers



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QSP Newsletter crossword questions

Clues Across

1. Term to describe blood cell production in the body (11)
5. Red cell no longer a biconcave disc (10)
8. Mature Neutrophil with only one or two lobes is called this (2 words 6-4) (11)
9. Red cells that are shaped like when you cry (2 words 4,4) (9)
12. This type of malaria is very neat and have ring forms (10)
15. What does the Q stand for in QSP (7)
17. Be careful under the mistletoe you might catch this (2 words 9,5) (15)
19. What month is in the name of a stain and the name of a disorder characterised by large platelets (3)
22. What species of insect is responsible for transmitting Malaria (9)
25. Which company produces Quality Slide Program (6)
26. You may aim for this cell (2 words 6,4) (11)
29. This lens on a microscope is the closest lens to the slide (9)
31. What white cell is the least common in normal blood (8)
33. This cell can either be T or B (10)
34. This cell may be Russian (6)
35. Platelet pre cursor (13)
36. If you are Iron deficient your red cells are (10)
37. What cell has a normal volume of 9 -12 fl (8)
38. Rare hereditary disease where the red cells may look like those from burn patients (18)

Clues Down

2. This disorder can give background stain on the blood film (7)
3. Word to describe the changes in red cell shape (14)
4. You use this chamber to count cells manually (8)
6. what festive period gives its name to a coagulation disorder (9)
7. What feature can be seen in Neutrophils in infection (2 words 4,4) (10)
10. Not a bald cell (10)
11. A monocyte becomes one of these cells when it enters the tissue (10)
13. Immature red cells are characterised by showing this colour change (13)
14. Another name for smear cells (6)
16. Neutrophils from Females may show this appendage (9)
18. A "happy" red cell inclusion 3 words (6,5,6) (19)
20. A needle like structure found in blast cells (8)
21. These red cell inclusion may be produced by bake bean manufacturers (2 words 5,6) (12)
23. Red cells stacked like pennies (8)
24. A "mouthy" cell (11)
27. To describe difference in the size of red cells (12)
28. Red cells you need a supravital stain to manually count (12)
30. Most commonly found white cell in normal patients (10)
31. What you might find on a castle but also describes the technique of navigating through the slide when performing a differential (10)
32. Term to describe red cells larger than normal and seen in B12 or Folate deficiency (10)