ISSUE
46
April
2024

QSP Monthly
NEWSLETTER OF THE QUALITY SLIDE PROGRAM

HORIBA

This issue

April Slides

Slide 1
Nothing to report

Slide 2
Thrombocytosis

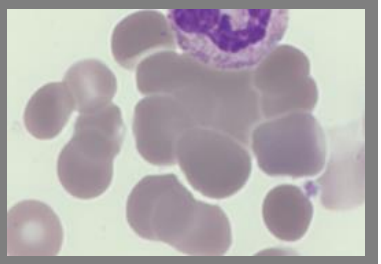
Slide 3
Lymphocytosis? Blastosis?
Mantle cell lymphoma

Slide 4
See case study opposite

Slide 5
Neutrophilia, Monocytosis, Macroplatelets

Slide 6
Anaemia
Leukocytosis
Followed by myelemia

Cell Quiz



What Red Cell feature is shown above?

Monthly Digital Case Study Presentation
April 2024, Slide 4

FBC Results

WBC 48.17* (10^3/mm3)
RBC 2.29* 10^6/mm3)
HGB 7.3* (g/dL)
HCT 21.2 (%)
MCV 92.3 (fL)
MCH 32.0 (pg)
MCHC 34.7 (g/dL)
PLT 65 (10^3/mm3)

Neutrophils 91%
Lymphocytes 1.6%
Monocytes 6.8%
Promyelocytes 1.5%
Metamyelocytes 0.8%
Normoblasts/Erythroblasts 3

Clinical Details

Male age 64, Medicine Unit

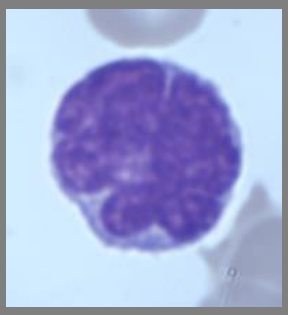
Slide Information

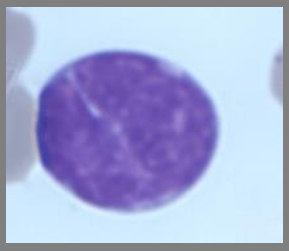
Anaemia
Echinocytes (++)
Thrombocytopenia
Neutrophilia: vacuolated neutrophils (+++)

Expert's comments:
Sepsis

QSP Quality Slide Program 2.0

Last Month's Quiz





A patient presents with numerous cells as above. What further investigation should be performed?

Answer

The cells shown were classified as Atypical Lymphocytes, the cells are large with an abnormal nucleus which may be described as being cerebriform. The cells are suspicious of Lymphoma (T Cell) and further investigations should be performed to elucidate the exact cell immunophenotype by flowcytometry.

Bibliography

Sepsis induced Coagulopathy: An update on Pathophysiology , Biomarkers and current guidelines

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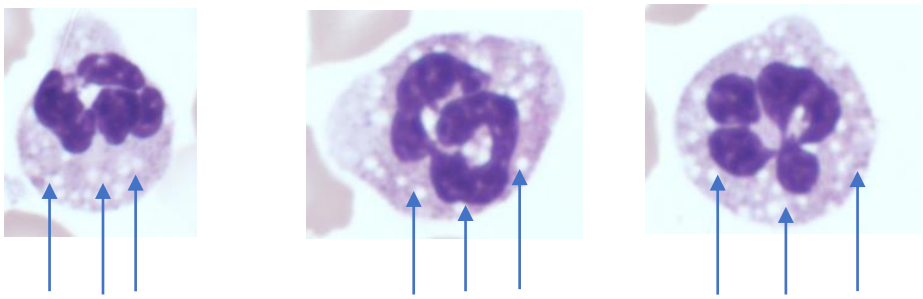
April 2024 Slide 4 Case Study

Vacuolated Neutrophils



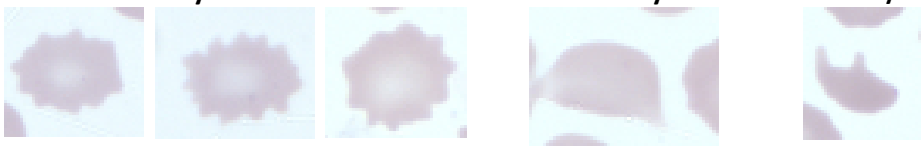
Arrows indicate some of the vacuoles present

Vacuoles are small clear spaces in the cytoplasm of cells, in this case, Neutrophils which arise from phagocytic activity stimulated by the release of cytokines in response to inflammation or injury.

Vacuolated Neutrophils can be seen in infection, particularly bacterial, alcohol toxicity, liver failure, gout, and thyroiditis. The combination of vacuolated neutrophils together with toxic granulation, is a strong indicator of sepsis.

The main red cell feature reported was the presence of echinocytes (from the Greek word echinos meaning hedgehog or sea urchin). Echinocytes may also be seen when there has been a delay in making the blood film from an EDTA sample. There are though an occasional acanthocyte and a suspicion of the presence of Schistocytes (red cell fragments) which together with the thrombocytopenia may indicate the presence of sepsis-induced Disseminated Intravascular Coagulation (DIC) or Haemolytic Uraemic Syndrome (HUS).

Echinocytes **Acanthocyte** **Schistocyte**



Coagulation assists in the body's fight against infections by trapping the pathogen in a fibrin network at the site of infection thereby limiting the spread of infection. Sepsis is a life-threatening condition caused by the immune system going into overdrive causing widespread inflammation and organ damage.

DIC is a condition where the coagulation cascade is activated causing both thrombotic and haemorrhagic complications resulting from intravascular fibrin formation. Tissue factor is the main trigger for activating the coagulation pathway in sepsis, tissue factor is located in the vascular endothelium. When endothelium damage occurs, its exposure leads to activation of the extrinsic coagulation pathway. Tissue factor is also present in inflammatory cells particularly monocytes and other circulating macrophages, following activation tissue factor as well as cytokines and chemokines are released into the circulation. Neutrophils also play a large part in the activation of the coagulation cascade through the expression of tissue factor and the release of chemical mediators and proteins. Not only is the coagulation cascade activated leading to inappropriate fibrin deposition but the anticoagulant pathways are deranged which leads to a hypercoagulable state.

Platelet and coagulation factors are consumed leading to a low platelet count, elevated Prothrombin Time (PT) and Activated Partial Thromboplastin Time (APTT), low Fibrinogen and increased Fibrin Degradation Products (FDP) or D Dimers.
DIC is seen in approx.35% of all sepsis patients.