

Results (if a Case Study enter NA): NA

Conclusion: Composite CHL and FL are often clonally related and may share a common progenitor B-cell origin – likely a germinal center B-cell – from which additional genetic abnormalities are acquired to develop two distinct lymphomas.

Hematology/Coagulation

The Practicality of Viscoelastic Testing in Acute Hemorrhage to Guide Appropriate Transfusion Management

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Introduction/Objective: Acute hemorrhage often leads to multiple blood product transfusions and warrants efficient and dependable laboratory tests to elucidate the etiology for appropriate transfusion management. Conventional coagulation tests (aPPT, PT, INR, platelet count, fibrinogen) are inexpensive and have minimal labor requirements, but have slow turnaround times and may not accurately represent in vivo coagulopathies leading to inappropriate use of transfusion products, which in turn may lead to increased adverse events and mortality. Viscoelastic testing (VET) overcomes some of the disadvantages of conventional coagulation tests, but is not without its own limitations. This case study will summarize the advantages and disadvantages of VET by presenting two cases to highlight clinical situations in which VET is used and its impact on guiding management and clinical outcomes.

Methods/Case Report: We present 2 cases of acute hemorrhage to illustrate the importance of correct interpretation of VET in the appropriate clinical setting. Case 1 features a clinical situations in which TEG was misinterpreted due to lack of communication with the laboratory while Case 2 presents an acute hemorrhage situation in which Rapid TEG was used to guide transfusion strategy. While VET has many advantages in acute hemorrhage, clinicians must be aware of the disadvantages and the potential for misinterpretation of data.

Results (if a Case Study enter NA): NA

Conclusion: VET is useful in acute hemorrhage if its functionality is understood and interpretation is correct. Appropriate use of VET may lead to effective transfusion management and improve clinical outcomes. However, it is imperative clinicians are aware of the limitations of VET when making clinical decisions. VET can only improve patient outcomes if it is used in the proper clinical situation and with proper interpretation of the data. Appropriate use of VET has the potential to improve

transfusion management and ultimately lead to better patient outcomes.

Acquired Glanzmann Thrombasthenia in a Pediatric Patient with Alagille Syndrome

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Introduction/Objective: Acquired Glanzmann Thrombasthenia is a rare bleeding disorder that is characterized by inhibition of glycoprotein IIb/IIIa signaling, usually by an autoantibody, leading to an interference in platelet aggregation. Clinically, this disorder presents with spontaneous mucocutaneous bleeding in the setting of a normal platelet count. Acquired Glanzmann Thrombasthenia has been associated with primary immune thrombocytopenic purpura (ITP), several types of hematologic and solid malignancies, solid organ transplants, and other autoimmune disorders.

Methods/Case Report: A 4-year-old female patient with a history of Alagille Syndrome requiring liver transplant at age 3 was admitted to the hospital after presenting to the emergency department with complaints of bruising, nosebleeds, and a petechial rash. The patient was found to have a platelet count of 11 K/mm³ and was diagnosed with ITP. The patient received a single dose of IVIG at 1g/kg with subsequent resolution of bleeding and a recovering platelet count of 27 K/mm³ 12 hours after administration. However, two months later, the patient presented again with worsening bruising, multiple nosebleeds per day, and worsening petechiae. Lab studies revealed the patient's platelet count was within normal limits. A platelet antibody screen was positive with a subsequent Platelet Antibody Bead Array revealing anti-Gp IIb/IIIa HPA-1 and HPA-3 positivity.

Results (if a Case Study enter NA): N/A

Conclusion: Acquired Glanzmann Thrombasthenia is a rare bleeding disorder that is the result of interference with platelet aggregation. Antibodies that may be associated with any of several underlying conditions lead to impaired platelet function and subsequent mucocutaneous bleeding. The present case represents an occurrence of Acquired Glanzmann Thrombasthenia in a patient with multiple risk factors for development of the disorder.

Machine learning based decipherment of Cell Population Data: a promising hospital front-door screening tool for COVID-19

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Introduction/Objective: Key challenges against early diagnosis of COVID-19 are its symptoms sharing nature and prolong SARS-CoV-2 PCR turnaround time. Hither machine learning (ML) tools experienced by routinely generated clinical data; potentially grant early prediction.

Methods/Case Report: Routine and earlier diagnostic data along demographic information were extracted for total of 21,672 subsequent presentations. Along conventional statistics, multilayer perceptron (MLP) and radial basis function (RBF) were applied to predict COVID-19 from pre-pandemic control. Three feature sets were prepared, and performance evaluated through stratified 10-fold cross validation. With differing predominance of COVID-19, multiple test sets were created and predictive efficiency was evaluated to simulate real-fashion performance against fluctuating course of pandemic. Models validation was also inducted in prospective manner on independent dataset, equating framework forecasting to conclusions from PCR.

Results (if a Case Study enter NA): RBF model attained superior cross entropy error 20.761(7.883) and 20.782(3.991) for Q-Flags and Routine Items respectively while MLP outperformed for cell population data (CPD) parameters with value of 6.968(1.259) for 'training(testing)'. Our CPD driven MLP framework in challenge of lower (<5%) COVID-19 predominance affords greater negative predictive values (NPV >99%). Higher accuracy (%correct 92.5) was offered during prospective validation using independent dataset. Sensitivity analysis advances illusive accuracy (%correct 94.1) and NPV (96.9%). LY-WZ, Blasts/Abn Lympho?, 'HGB Interf?', and 'RBC Agglutination?' are among novel enlightening study attributes.

Conclusion: CPD driven ML tools offer efficient screening of COVID-19 patients at presentation to hospital to backing early expulsion and directing patients' flow-from amid the initial presentation to hospital.

Kinetics of Eosin-5-maleimide Binding to Red Blood Cells

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Introduction/Objective: The binding of eosin-5-maleimide (EMA) to red blood cells in different pH conditions has not been well-investigated. The current standard protocol uses phosphate buffered saline at pH 7.0 to 7.5 for the binding reaction. The reaction typically uses a sixty-minute incubation. However, the effect of pH on EMA binding remains to be determined, nor have the reaction times at different pH conditions. This study utilizes optimal pH conditions of 6.0, 6.5, 7.0, 7.5, 8.0, and 8.5 to characterize EMA binding. The two parameters, time, and pH were investigated to extensively describe the binding kinetics of eosin-5-maleimide.

Methods/Case Report: The working EMA solutions in phosphate buffered saline at different pHs (specifically 6.0, 6.5, 7.0, 7.5, 8.0, and 8.5) were incubated in the dark with 1 μ L of washed red blood cells and 25 μ L of working EMA solution. The red blood cells and working EMA solution were vigorously mixed before the specified incubation time. The binding was recorded at specified time points, namely 1, 2, 4, 8, 16, 32, and 64 minutes for each pH condition. The binding reaction was terminated by washing three times with 0.1% bovine serum albumin (BSA) in PBS and centrifuged at 400 g for 5 minutes. The red blood cells were then resuspended with 500 μ L of PBS and ran in the BD FACSLyric™ flow cytometer.

Results (if a Case Study enter NA): The current EMA binding protocol utilizes a neutral pH of 7.0 to 7.5 recorded at 64 min. Based on our data, better discrimination of hereditary spherocytosis red blood cells from normal red blood cells may be obtained at a more basic pH of 8.5. Thus, a statistical t-test was performed for the comparison between the current setup and the apparent optimal pH conditions at shorter reaction times of 16 min and 32min at pH 8.5.

Conclusion: The resulting data suggest that enhanced discrimination of HS red blood cells can be achieved in a more basic pH. This was evidently observed at pH 8.5, where the highest percentage decrease is recorded, and the most significant difference compared to the other pH conditions. In conclusion, the study identifies that better discrimination of hereditary spherocytosis red blood cells from normal red blood cells can be determined using pH 8.5 with a shorter incubation time of 32 min. The pH 8.5 at 16 min condition could also be considered if the clinical batch size allows precise incubation of 15 min.

Concordance and discordance among antiphospholipid syndrome screening assay.

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Introduction/Objective: The lupus anticoagulant (LA) panel utilizing dilute Russell's viper venom and LA-responsive APTT remains the front-line screen for detecting the presence of clinically significant antibodies in the diagnosis of antiphospholipid syndrome. Receiving anticoagulant therapy limits the utility of clotting-based methods due to increased risk of false positive results. Anti-cardiolipin (aCL) and anti- β 2-glycoprotein I (a2G β PI) antibody titers have also been employed for the detection of anti-phospholipid antibodies; however, they are not influenced by anticoagulation therapy. The International Society on Thrombosis and Haemostasis recommends that all three tests should be performed to appropriately assess the risk of lupus anticoagulant/