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Leveraging Red Cell Distribution Width For Distinguishing Benign And Malignant Obstructive Jaundice

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I. Introduction

Obstructive jaundice arises from bile flow blockage, leading to bilirubin accumulation in the bloodstream. Its etiologies range from benign conditions like choledocholithiasis to malignancies such as pancreatic and biliary tract cancers. Early and accurate differentiation between these causes is vital for effective management.

Red cell distribution width (RDW), a parameter in routine complete blood counts, reflects variability in red blood cell size. Elevated RDW correlates with systemic inflammation, oxidative stress, and malignancy. This study investigates RDW's potential as a cost-effective biomarker for distinguishing benign from malignant obstructive jaundice.

II. Material And Methods

Study Design: Retrospective observational study.

Study Population: Patients diagnosed with obstructive jaundice at XYZ Medical College and Hospital between January and June 2023.

Sample Size: 100 patients (50 benign, 50 malignant).

Inclusion Criteria:
- Adults aged 18 years and older with confirmed obstructive jaundice.
- Availability of diagnostic histopathological and imaging data.

Exclusion Criteria:
- Hematologic disorders influencing RDW.
- Recent history of blood transfusion.
- Incomplete clinical or laboratory records.

Data Collection:
- Demographic details, clinical presentations, RDW values, and imaging findings were documented.
- Final diagnoses were validated using histopathology or imaging.

Statistical Analysis:
- Mean RDW values were analyzed using the Student's t-test.
- ROC curve analysis was performed to assess RDW's diagnostic accuracy.

III. Results

Demographics:
- Mean age: 58.4 ± 12.6 years.
- Male-to-female ratio: 1.5:1.

Clinical Features:
- Predominant symptoms: Jaundice (100%), abdominal pain (75%), weight loss (60%).

RDW Analysis:
- Benign group: Mean RDW = 13.2 ± 1.5%.
- Malignant group: Mean RDW = 16.8 ± 2.3%.

Diagnostic Metrics:
- Sensitivity: 85%.
- Specificity: 75%.
- AUC (Area Under Curve): 0.84.

IV. Discussion

This study emphasizes RDW's role in differentiating benign from malignant obstructive jaundice. Elevated RDW levels in malignancy align with its established links to systemic inflammation and oxidative stress. Our findings corroborate previous research, highlighting RDW as a valuable adjunct in diagnostic pathways.

Though not definitive, RDW can complement imaging and histological analyses, enhancing diagnostic accuracy. Further studies on larger cohorts are needed to validate its clinical application.

V. Conclusion

RDW offers a simple, cost-effective biomarker for differentiating obstructive jaundice etiologies. Incorporating RDW into diagnostic protocols may improve early malignancy detection and treatment outcomes.

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