THE ROLE OF ARTIFICIAL INTELLIGENCE IN DIAGNOSING AND TREATING INTERSTITIAL CYSTITIS / BLADDER PAIN SYNDROME

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ABSTRACT 726

BACKGROUND

- IC/BPS IS OF UNKOWN ORIGIN
- CHRONIC CONDITION
- DEBILITATING DISEASE; NO VALIDATED TX OR DX
- AI EMERGED AS A PROMISING TOOL

A — EVALUATE AI METHODS

I — NOTE STUDY LIMITATIONS

M — EXPLAIN CLINICAL UTILITY

METHODS

- (2003-2024); n=25 studies
- **Samples:** Urine, Stool, Tissue, Imaging, Questionnaires
- **Models:** Logistic regression, SVM, CNN, ML
- **Evaluation**: Accuracy, AUC, Sensitivity/Specificity
- **Data Sources:** PubMed, ScienceDirect, Scopus

RESULTS

URINE N=4,397

Findings:
- Detect molecular changes **(IL-6, IL-8, MCP-1, GRO)**

Accuracy/Impact:
- ML models: 87-96% accuracy
- non invasive alternative.

BLOOD N=259

Findings:
- Molecular changes common between IC and MDD**(ABCD2, ATP8B4, TNNT1)**

Impact:
- Support dual screening
- Targeted therapy

STOOL N=34

Findings:
- Microbiome shifts
- 5 gut bacteria reduced in IC

Impact:
- Gut microbiome serve as new biomarkers
- Targeted therapy

SYMPTOM N=317

Findings:
- Surveys (ICSI/ICPI) classified subtypes (Bladder specific, myofascial, non-urologic pelvic pain).

Impact:
- Targeted therapy

SAMPLES/IMAGES N≈906

Findings:
- Gene expression changes in IC **(KRT20, BATF..)**
- Differentiated Hunner IC vs. Non-Hunner IC

Accuracy/Impact:
- Outperformed expert urologists
- High Diagnostic accuracy
- Targeted therapy

INTERPERTATION OF RESULTS

AI BENEFITS

- NON-INVASIVE DIAGNOSIS
- EARLY DETECTION
- TARGETED THERAPIES

LIMITATIONS

- SMALL DATASETS
- LIMITED DIVERSITY
- LACK OF VALIDATION
- OVERLOOKED CO-MORBIDITIES
- LACK OF EXPLAINABILITY

CONCLUSION

- **STOOL/URINE:** NON-INVASIVE TOOLS USEFUL IN INTEGRATIVE MEDICINE
- **TISSUE:** INVASIVE BUT USEFUL IN SPECIALIZED CLINICS FOR COMPLEX CASES
- **BLOOD:** USEFUL IN MULTIDISCIPLINARY CLINICS FOR BPS AND CO-MORBIDITIES
- **SYMPTOM-AI:** USEFUL IN EARLY SCREENING IN PRIMARY CARE
- **NEED LARGER DATASETS**

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