Evaluation of AI-Based Triage for Suspected Hematologic Emergencies: A Simulation Study Using ChatGPT and OpenEvidence

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Background

Timely and accurate triage of hematologic emergencies such as tumor lysis syndrome (TLS), hemophagocytic lymphohistiocytosis (HLH), and cytokine release syndrome (CRS) is critical for patient outcomes.

Artificial intelligence (AI) models, including large language models like ChatGPT and clinical knowledge engines such as OpenEvidence, have the potential to augment clinical decision-making in acute care settings.

Methods

We conducted a simulation study to evaluate the accuracy and feasibility of AI-based triage for suspected hematologic emergencies. Standardized clinical vignettes representing TLS, HLH, and CRS were presented to three triage modalities:

(1) Board-certified hematologists and hem/onc fellows

(2) AI models (ChatGPT and OpenEvidence), and

(3)A hybrid approach combining AI recommendations with physician review. Each scenario was assessed for diagnostic accuracy, triage appropriateness, and time to decision. Performance metrics were compared across modalities using descriptive statistics and paired analyses.

Results

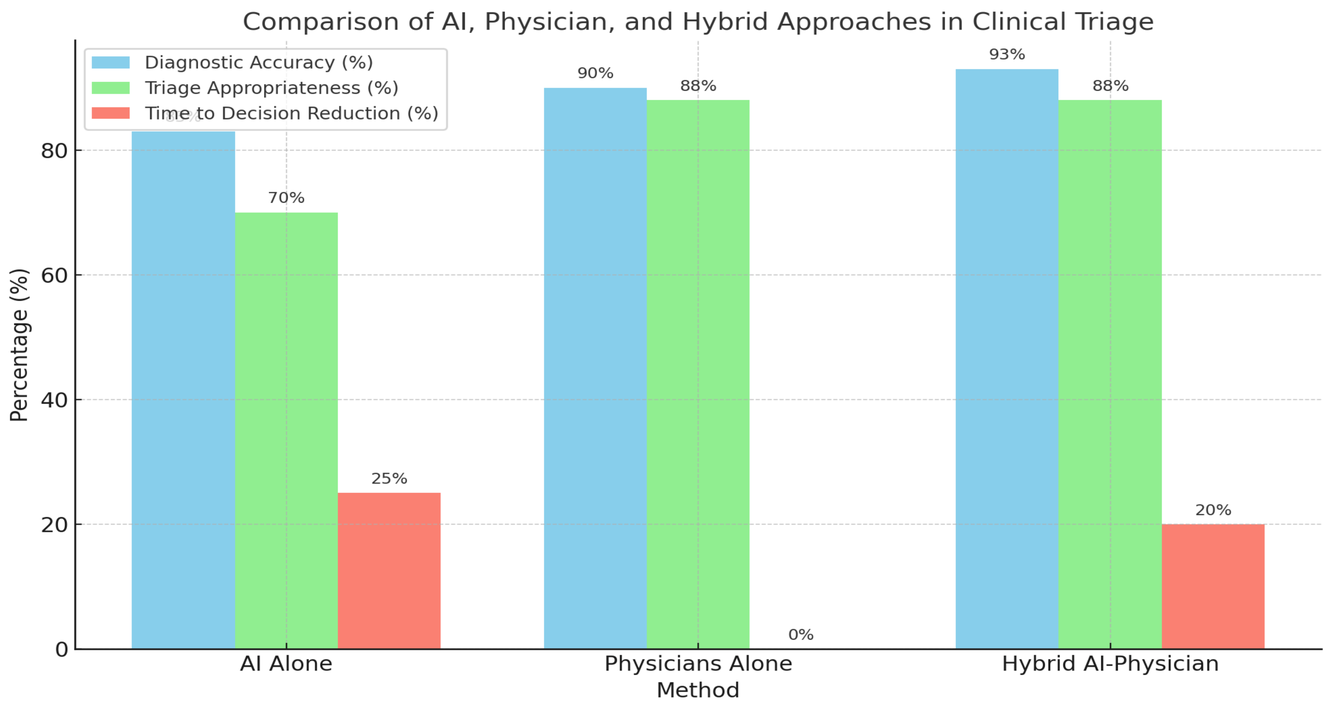
A total of 30 simulated cases (10 each for TLS, HLH, and CRS) were evaluated.

The hybrid AI-physician approach demonstrated the highest diagnostic accuracy (93%), followed by physicians alone (90%) and AI alone (83%).

Triage appropriateness was similar between the hybrid and physician groups, both outperforming AI alone.

Notably, the AI models provided rapid initial assessments, reducing average time to decision by 25% compared to physician-only triage.

Qualitative analysis revealed that AI models excelled at flagging classic presentations but struggled with atypical or overlapping features, highlighting the value of physician oversight.



Conclusion

AI-based triage using large language models and clinical knowledge engines is feasible and can enhance the speed and accuracy of decision-making for suspected hematologic emergencies.

The hybrid approach, integrating AI support with physician expertise, offers the greatest potential for safe and effective clinical implementation.

Further prospective studies are warranted to validate these findings in real-world settings and to optimize AI-physician collaboration in hematology.

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