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Prognostic Factors of Prenatally Diagnosed Isolated Arachnoid Cysts: A Systematic Review and Meta-Analysis

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Background

Prenatally detected isolated arachnoid cysts have variable outcomes, ranging from regression or stability to progressive mass effect and neurodevelopmental impairment. Whether cyst size, location, and treatment can predict outcomes remains unclear.

Objective

To determine which prenatal imaging and clinical factors are associated with adverse outcomes.

Methods

A PRISMA-compliant systematic review and meta-analysis was conducted using studies from PubMed, Embase, and the Cochrane Library through September 2025.

Eligibility and Outcomes

Prenatally diagnosed isolated arachnoid cysts and congenital cases confirmed within 6 months after birth were included; acquired cysts and cases with associated abnormalities were excluded. Adverse outcomes included neurological impairment, persistent symptoms, re-intervention, or death. Overall, 73 studies involving 563 patients were analyzed, with a pooled adverse outcome rate of 29%.

Results

Compression was associated with a higher adverse outcome rate (41% vs 25%, $p=0.03$). Size, location, treatment, and their interactions showed no significant differences.

Interpretation

Compression may be more important than cyst morphology in predicting outcomes. Results should be interpreted cautiously due to limited observational evidence.

Conclusion

Cyst compression was the only significant prognostic factor identified. Prenatal assessment and counselling should focus on mass effect and the integrity of surrounding brain structures rather than cyst size or location alone. Adverse outcome rates were 41% with compression versus 25% without compression.

