Introduction

• Surgical resection of craniopharyngiomas can result in hypopituitarism
• In the pediatric population, postoperative growth hormone deficiency can result in an impaired organ maturation.
• Significant controversy exists on whether growth hormone replacement therapy (GHRT) contributes to the recurrence of craniopharyngiomas in the pediatric population and may place patients at a higher risk of residual tumor growth.

Objectives

A systematic review and meta-analysis were conducted to examine the effect of GHRT on the recurrence of craniopharyngioma among pediatric patients who underwent a surgical resection.

Methods

• PubMed, EMBASE, and Cochrane databases were searched through October 28, 2015 for comparative studies (n > 5 patients) that evaluated the effect of GHRT on the recurrence of pediatric (newborn-18 years old) craniopharyngiomas. Pooled effect estimates were calculated using fixed- and random-effects models.
• Heterogeneity, in the analysis, was evaluated by the Q statistic and I² statistic.
• Potential sources of heterogeneity were explored using sub-group analyses by categorical covariates (growth hormone replacement therapy, country, international journal Impact factor, Newcastle-Ottawa Scale—to assess study quality; and center).
• Covariates such as age range and type of surgery could not be assessed for heterogeneity sources as information was NA.
• Potential publication bias was assessed by using funnel plots, Egger’s linear regression test, and Begg’s correlation test.
• If publication bias was indicated, the # of missing studies in a meta-analysis was evaluated by the trim and fill method.

Results

• Eight studies (7 case series and 1 retrospective cohort) with 2,167 patients with craniopharyngioma were included in the final analysis.
• The fixed pooled prevalence was 11.7% (95% CI: 10.4%; 13.2%) for GHRT+ and 43.1% (95% CI: 16.7%; 74.1%) for GHRT− (Pinteraction = 0.23).
• Among the GHRT group, the fixed pooled prevalence was 15.5% (95% CI: 12.4%; 19.1%) for studies outside the USA and 10.4% (95% CI: 9.0%; 12.0%) for studies conducted in the USA (Pinteraction = 0.07).
• The fixed pooled prevalence was 10.4% (95% CI: 9.10%; 11.8%) for multiple-center studies and 37.9% (95% CI: 27.3%; 49.7%) for single-center studies (Pinteraction < 0.01).
• The fixed pooled prevalence was 7.50% (95% CI: 5.60%; 10.0%) for high impact factor journals and 12.9% (95% CI: 11.3%; 14.7%) for low impact factor (Pinteraction = 0.16).
• The fixed pooled prevalence was 10.4% (95% CI: 9.0%; 12.0%) for high NOS and 15.5% (95% CI: 12.4%; 19.1%) for low NOS (Pinteraction = 0.07).

Discussion

• GHRT among pediatric patients with biochemical evidence of GH deficiency after surgical resection for craniopharyngioma remains a topic of controversy for clinicians and surgeons.
• Our current meta-analysis demonstrated that pediatric patients treated with GHRT after surgical resection of craniopharyngioma had a lower incidence of tumor recurrence.
• There was insufficient evidence in the current literature to indicate that GHRT promoted growth of craniopharyngiomas after surgical resection.

Strengths and Limitations

• This meta-analysis showed that GHRT use was not associated with the recurrence of craniopharyngioma among carefully selected pediatric patients.

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