

Effectiveness of Prism Therapy Versus Botulinum Toxin Injection in the Management of Sixth Cranial Nerve Palsy: A Systematic Review and Meta-analysis

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Background

- Sixth cranial nerve palsy causes horizontal diplopia due to impaired lateral rectus function, affecting ocular alignment and quality of life.
- Prism therapy and botulinum toxin injection are common treatments, but their comparative effectiveness remains uncertain.
- This systematic review and meta-analysis evaluates both interventions to guide evidence-based management of sixth nerve palsy.

Methods

- **Databases:** PubMed, Cochrane, Embase, Scopus, ClinicalTrials.gov
- **Studies included:** 4 studies (n = 194); Prism therapy = 102, Botulinum toxin = 107
- **Outcomes:**
OSR, AD-R, AD-NR, G-4, G-5
- **Analysis:** Random-effects model; (RR) with 95% CI; R Studio v4.4.3 with “meta” package.

Results

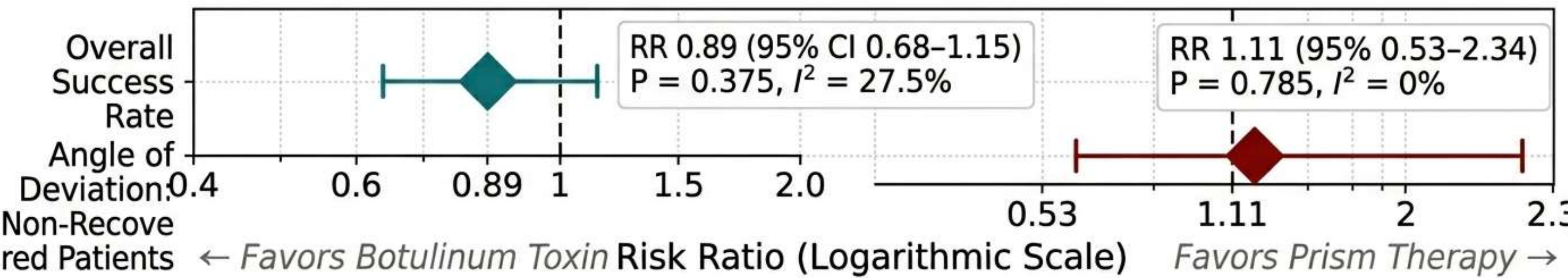
Table: Outcomes of Prism Therapy vs Botulinum Toxin

Outcome	RR	95% CI	P Value
OSR	↓ 0.89	0.68 – 1.15	0.375
AD-R	↑ 1.23	0.70 – 2.17	0.468
AD-NR	↑ 1.11	0.53 – 2.34	0.785
G-4	↓ 0.60	0.32 – 1.16	0.128
G-5	↓ 0.87	0.51 – 1.49	0.613

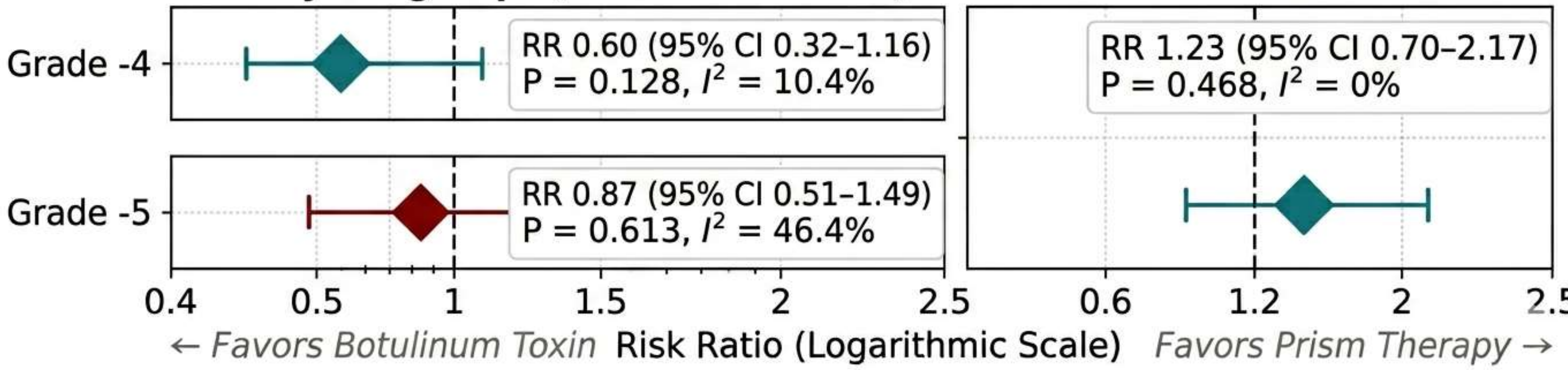
OSR: Overall Success Rate; AD-R: Angle of Deviation – Recovered; AD-NR: Angle of Deviation – Non-Recovered
G-4: Grade –4 Abduction Deficit; G-5: Grade –5 Abduction Deficit; RR: Risk Ratio, CI: Confidence Interval

Forest Plot: Prism Therapy vs Botulinum Toxin in 6th Nerve Palsy

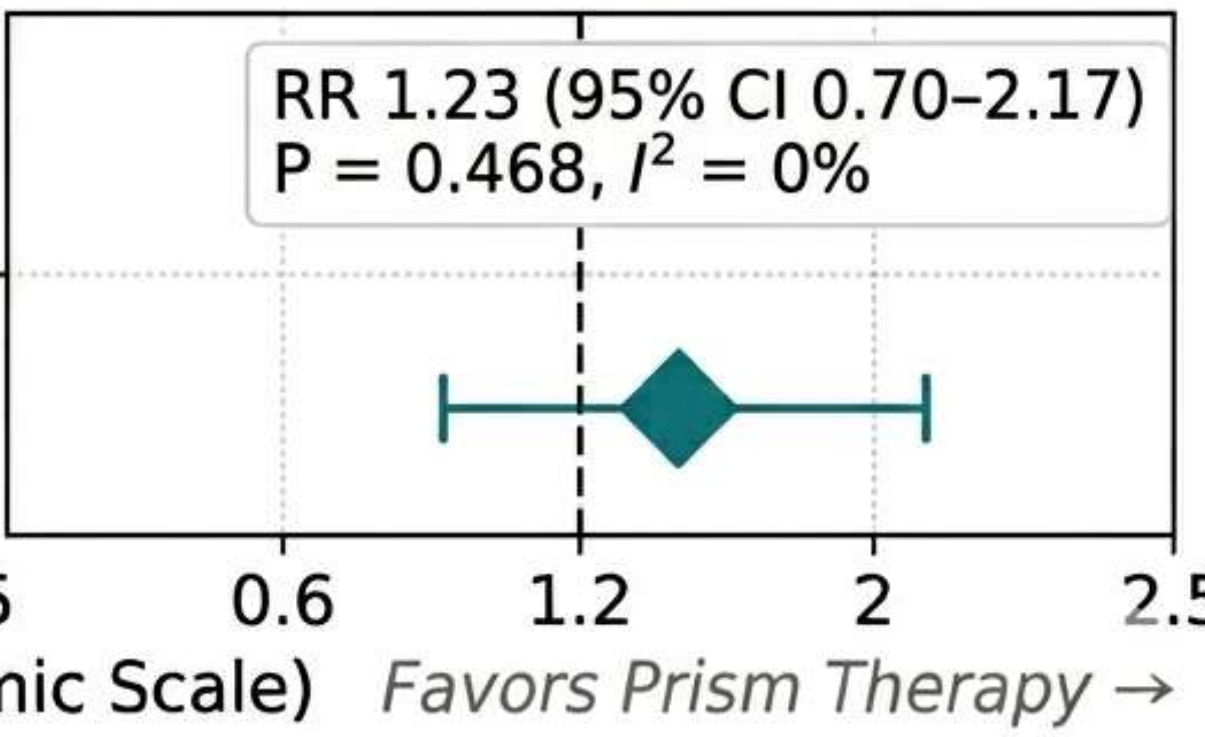
PANEL A: Main Effectiveness Outcomes



PANEL B: Severity Subgroups (Abduction Deficit)



PANEL C: Recovered Patients



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Conclusion

- Botulinum toxin and prism therapy show comparable effectiveness in managing sixth cranial nerve palsy.
- Botulinum toxin may offer better recovery in moderate-grade (-4) palsy, though differences are not statistically significant.
- No clear advantage is observed in severe-grade (-5) palsy, highlighting the need for individualized treatment.
- Further studies with larger cohorts are needed to confirm these findings and refine treatment guidelines.

References

