Cerebrospinal fluid (CSF) shunt infections impart significant morbidity and occasional mortality in adults and children. Optimal management as per the Infectious Diseases Society of America (IDSA) guidelines is removal of the shunt, placement of an external ventricular drain (EVD) and then placement of a new shunt. However, the optimal choice, total duration and route of administration of antibiotics and the optimal timing for replacement of the shunt following CSF sterilization are not clear, resulting in significant heterogeneity in management between centers and between neurosurgeons.

A systematic review was performed of studies that compared time to CSF sterilization or rate of recurrence with different interventions for CSF shunt infections.

A librarian directed search was conducted in May 2019. Studies that compared complete versus incomplete shunt removal were excluded as current guidelines strongly recommend complete removal. The methodological quality of each included study was assessed using tools tailored to the type of research. Because of the heterogeneity of interventions, the primary analysis is narrative.

All studies were moderate quality cohort studies (Newcastle-Ottawa Scale) published 1995 – 2019.

Seven included only children.

Four studies compared the duration of antibiotics: none showed that a longer course prevented recurrences.

Two analyzed addition of rifampin with one showing a decrease in recurrences while the other had a small sample size.

No studies analyzed the addition of intraventricular antibiotics, but one showed equally good results with twice daily versus once daily administration.

One study reported no difference in recurrences with placement of antibiotic impregnated catheters.

Recurrence rates did not differ with shunt replacement 7 days or more versus less than 7 days after CSF became sterile. There were no recurrences in either group when shunt replacement was performed after sterile CSF cultures were obtained at 48 hours versus 24 hours after antibiotics were stopped.

A new shunt entry site did not decrease recurrences.

Records identified through database search
n = 4,213

Records after duplicates removed
n = 2,208

Records screened by title and abstract
n = 2,208

Records excluded
n = 2,233

Full text records assessed for eligibility
n = 85

Studies included in systematic review, n = 8

Studies included in systematic review, n = 8

Full text records excluded, n = 77
n = 35 study design
n = 27 comparison group
n = 10 intervention
n = 5 duplicate

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ACKNOWLEDGMENTS

METHODS

CONCLUSIONS

OBJECTIVES

BACKGROUND