Introduction. Long-term cocaine use is associated with a wide range of cognitive deficits and neuropsychiatric pathologies. Repetitive transcranial magnetic stimulation (rTMS) is an emerging therapeutic strategy that stimulates the prefrontal cortex and may improve cognitive inhibitory control and decision-making. This systematic review aimed to evaluate and synthesize evidence on the safety, effectiveness, and cost effectiveness of rTMS for the treatment of cocaine addiction.

Methods. A systematic review of the literature was carried out. The following electronic databases were searched to identify relevant studies published from inception to October 2020: MEDLINE, Embase, CINAHL, PsycINFO, the Cochrane Central Register of Controlled Trials, and Web of Science. Randomized controlled trials (RCTs), non-randomized controlled trials (nRCTs), case series studies, and full economic evaluations were included.

Results. A total of 12 relevant studies were identified, which included five RCTs, one nRCTs, and six case series studies. None of the studies reported data on cost effectiveness. The results indicated that rTMS reduces cocaine cravings and the number of doses consumed. No serious adverse effects were observed.

Conclusions. The ability to modulate the craving for cocaine in a specific way with non-invasive brain stimulation techniques, such as rTMS, could be a new adjunct to the behavioral treatment of addiction, especially for cocaine use where there is currently no approved pharmacological treatment. Despite the low quality of the included studies, preliminary results indicate that rTMS may reduce cocaine use and cravings. In any case, since this effect is considered moderate, future studies with larger sample sizes and longer follow up are required.