

Comparison of Electroconvulsive Therapy and Transcranial Magnetic Stimulation for Perinatal Depression

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Abstract

Perinatal depression is a subset of major depressive disorder (MDD) affecting women during pregnancy up to 1 year postpartum.¹ The first-line treatments for perinatal MDD include psychotherapy and pharmacotherapy.² However, this may not be sufficient for remission in certain patients. As well, women may be concerned about taking antidepressant medication that passes through the placenta to the fetus or through the breast milk to the infant.²⁻⁵ The second-line treatments for perinatal MDD include electroconvulsive therapy (ECT) or transcranial magnetic stimulation (TMS).^{6,7} These procedures require fewer or no medication, and could have an important role in perinatal MDD treatment.

Purpose

- PICO: is ECT or TMS preferred for the treatment of MDD in pregnant and postpartum patients?
- Learning objectives: short- and long-term maternal outcomes, risks to the fetus or infant

Introduction

- Perinatal depression is a subset of MDD affecting pregnant women through 1 year after delivery.¹
- Women with perinatal MDD are at risk of poorer physical health, suicide, and decreased bonding with the infant.⁸⁻¹¹
- Perinatal MDD is associated with paternal depression, relationship difficulties, low infant birth weight, preterm delivery, child abuse, and future psychiatric disorders in the child.¹¹⁻¹⁵
- The perinatal MDD rate in the United States is 11.5%.¹ The illness is associated with increased healthcare expenditures and decreased economic yield from mothers.¹⁶ The estimated cost of untreated perinatal mood disorders from birth to 5 years postpartum was \$14 billion in 2017.¹⁶
- During ECT, a seizure is induced under anesthesia.¹⁷ With TMS, a copper coil placed on the patient's forehead creates electrical activity on the brain surface.¹⁸ These treatments may work by changing neurotransmitter levels, improving brain blood flow, and modifying brain activity.^{18,19}

Methods

- This was a systematic literature review of a PICO question, performed using the PRISMA strategy.²⁰
- Databases included Science Direct, PubMed, EMB Review, and EBSCO Host.
- Inclusion criteria: English language, research study, pregnant or postpartum subjects up to 1 year after delivery, diagnosis of MDD, TMS or ECT treatment, quantitative depression scale.
- Articles were compared for common themes.

Results

- The search resulted in 646 discrete articles. Using inclusion criteria, this was reduced to 11 articles.
- ECT articles: Bulbul (2013), Grover (2018), Haxton (2016), and Rundgren (2018).²¹⁻²⁴
- TMS articles: Cox (2020), Ferrão (2018), Garcia (2010), Kim (2011), Kim (2019), Ozmut (2015), and Sayar (2013).²⁴⁻³¹
- Scales included the Clinical Global Impressions (CGI-S), Hamilton Depression Rating (HAM-D), Montgomery-Asperg Depression Rating (MADRS), Beck Depression Inventory (BDI), Edinburgh Postnatal Depression (EPDS), and Inventory of Depressive Symptomatology-Self-Report (IDS-SR).

Figure 1. Comparison of HAM-D scores across studies

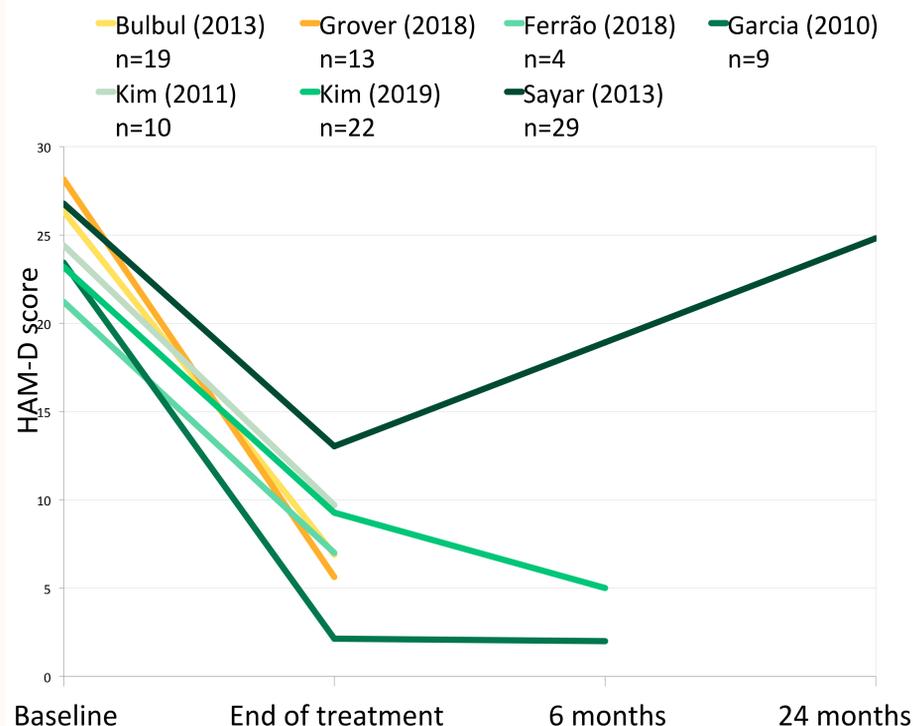
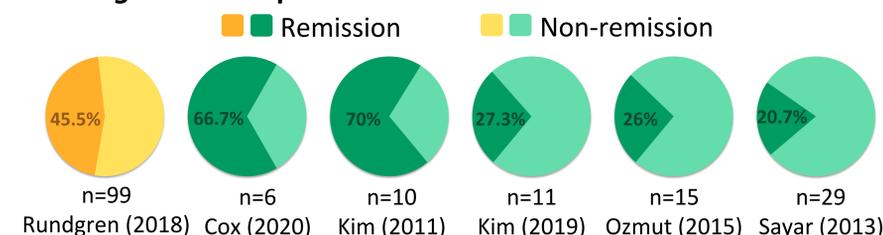


Figure 2. Comparison of remission rates across studies



Discussion

- ECT and TMS were effective for remission at the end of treatment.²¹⁻³¹
- None of the ECT studies reported long-term outcomes.²¹⁻²⁴ Of the 3 TMS studies that assessed long-term outcomes, depression scores remained below baseline at 6 and 24 months.^{27,29,31}
- ECT maternal adverse effects were temporary, including transient uterine contractions, memory disturbance, and aching pain.²⁶⁻³⁰
- ECT fetal adverse events included 1 still birth, 1 infant with hip dysplasia and 1 with heart failure.²¹
- TMS maternal adverse effects were temporary, including coil site discomfort, poor concentration, headache, nausea, and supine hypotension.²⁶⁻³⁰
- TMS fetal adverse events included 3 late premature deliveries.²⁹
- For ECT and TMS, adverse fetal outcomes could not be attributed to perinatal MDD treatment.²¹⁻³¹

Conclusions

- Perinatal MDD has a negative impact on maternal, paternal, and child physical and emotional health, as well as on healthcare costs.^{8,13-16,32}
- ECT is a more effective treatment, but mothers may prefer TMS to avoid medication.^{33,34}
- With further research, ECT and TMS may be considered more appropriate for the perinatal population than antidepressant medication.

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