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Commentary

Electroconvulsive therapy in the elderly: An update

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Electroconvulsive therapy (ECT) remains one of the most effective treatments for depression, catatonia and other conditions. Additionally, it appears to be particularly efficacious in the elderly population. Furthermore, since 'Electroconvulsive Therapy in Geriatric Psychiatry: A Selective Review' was previously published, there has been additional evidence of not just ECT's efficacy in this subset of the population, but also its safety [1]. This commentary will aim to inform others about advances in this uniquely effective treatment consistent with the latest treatment guidelines and evidence.

Perhaps the most comprehensive study examining this unique population is the Prolonging Remission in Depressed Elderly (PRIDE) study. In Phase 1, it examined older patients (above age 60), with Major Depressive Disorder (MDD), who received acute right unilateral ultra-brief pulse (RUL-UB) ECT (3 times weekly for about 7 treatments on average) augmented with Venlafaxine, with about 62% achieving remission [2]. In Phase 2, patients from Phase 1 who achieved remission, received either symptom-titrated, algorithm-based longitudinal ECT (STABLE) in addition to pharmacotherapy (Venlafaxine and Lithium) or pharmacotherapy only (Venlafaxine and Lithium) [2-4]. The novel STABLE algorithm provides for flexible and individualized ECT treatments depending on patients' responses, with 0, 1 or 2 treatments weekly depending on low, intermediate or high depressive relapse potential (based on HAM-D score tracking) [4]. Phase 2 of this study showed that patients who remitted after Phase 1 had significantly lower depression severity when they were maintained on STABLE ECT with pharmacotherapy relative to pharmacotherapy alone in a 6-month period [2-4]. It also provides for adequately treating depressed elderly patients – promptly and adequately treating those with early depressive symptom relapse and not overtreating those in stable remission [4]. Thus, Phase 2 of the PRIDE study successfully demonstrated sustained remission with minimal post-series relapse [4].

The Phase 1 study achieved 62% remission (148 out of 240 patients) and the Phase 2 study showed a baseline HAM-D score of mean=5.5 (95% CI=3.7, 7.3) in the STABLE plus pharmacotherapy group, compared to mean=9.4 (95% CI=7.5, 11.3) in the pharmacotherapy alone group – difference (effect size) of 3.9 points (95% CI=1.3, 6.5, p=0.004), clearly improved depression severity control in the STABLE plus pharmacotherapy group [2-4]. There was also a more rapid decline in the HAM-D scores in the STABLE plus pharmacotherapy group [4].

Despite the clear efficacy of ECT, concerns about tolerability and cognitive impairment associated with RUL-UB ECT in the elderly lingered (especially in those individuals with premorbid cognitive decline) [2-4]. Most neurocognitive concerns reported appeared to be short-lived (1-6 months) [2-4]. Neurocognitive impairments most associated with ECT are working memory, executive function, learning, attention, processing speed and memory (both retrograde and anterograde amnesia) [2-4]. Prior to the PRIDE study, these longitudinal concerns had not been specifically examined in older adults. PRIDE confirmed both high tolerability and low acute neurocognitive adverse effects in elderly patients with depression [2-4]. The PRIDE Phase 1 study also showed that RUL-UB ECT had mild and less severe neurocognitive effects than brief pulse RUL bitemporal or bifrontal ECT [2]. It found mild neurocognitive changes in delayed free recall of learned words and reduced processing speed [2]. Autobiographical memory, short-term free recall and recognition of learned words, phonemic fluency, processing speed, and visual scanning and cognitive flexibility appeared to be the cognitive domains most affected [2].

More recently, a deeper dive from Phase 2 of PRIDE indicated that these mild-to moderate neurocognitive impairments experienced post-ECT mostly returned to the average range after the 6 months [4]. It also found no significant difference in neurocognitive recovery between those who received ongoing ECT with pharmacotherapy and those who just received pharmacotherapy [4]. Furthermore, there appeared to be no significant difference in neurocognitive effects in individuals who received RUL UBP ECT a month after an acute series compared to controls who only received pharmacotherapy [4]. Phase 2 of PRIDE appears to have demonstrated the safety and efficacy of this treatment option in this patient population, and in doing so greatly alleviated many concerns about ECT's neurocognitive effects in the older population.

ECT continues to have an increased risk of delirium immediately following the treatment [5]. Recently, some factors have been shown to be associated with a further increase this risk, such as dementia, Parkinson's disease, catatonia, cerebrovascular disease, longer seizure length, high stimulus intensity, and bitemporal electrode placement [5]. However, ultra-brief pulse ECT and dexmedetomidine may help mitigate this risk [5].

Not only does ECT appear to be extremely effective at treating depression in the elderly, it also appears to be cost effective. A Dutch study examined that the length of hospital stay associated with inpatient ECT. It showed that ECT did not cause a significant difference in length of hospital stay compared to pharmacotherapy alone in the depressed elderly [6]. This study also again affirmed that there were no significant differences in cognition between both groups [6].

Although this review focuses on ECT for treating Major Depressive Disorder in the elderly, some data exist for successful treatment of bipolar disorder. However, most of these studies are not limited to the elderly. Interestingly, a systematic review showed higher response rates (77.1% versus 74.2%) and speed of response in bipolar depression compared to major depressive disorder (standardized mean difference of fewer ECT sessions to remission of -0.23 95% CI: -0.44 to -0.023, P=0.03) [7]. Remission rates (52.3% in both) remained similar in both groups [7].

The elderly population may receive ECT for a variety of indications, not just depression. ECT has shown benefit in treating aggression and agitation associated with a variety of dementias, such as Alzheimer's, vascular, frontotemporal and mixed dementia types when all other appropriate interventions (e.g., behavioral, environmental and pharmacologic) remain ineffective [8]. Van den Berg, et al. propose a tiered process starting with two-to-three times weekly with RUL-UBP ECT, as this has a lower risk of cognitive side effects, despite it possibly having a slower response time compared to brief pulse treatments [8,9]. This recommendation is based on the prolonged timeline of dementing processes and that lowering the risk of cognitive side effects are more important than a faster response [8,9]. Should this fail, they propose RUL high dose brief pulse (BP) treatments, especially as it causes less postictal confusion than bilateral stimulation [8,9]. Finally, they suggest that bilateral treatment could be used if unilateral treatment fails [8,9]. Bilateral treatment may also be considered in severely agitated patients, where a faster response may be required due to the patient's behavior placing them in imminent danger [8,9]. They propose a mechanism for worsening cognition, with bilateral treatment being related to brain atrophy in dementia. This atrophy may lead to shunting of the stimulus current through the frontal skull and cerebrospinal fluid due to the increased distance [8,9]. It is noteworthy that a significant portion of this population already have severe cognitive impairment, so it is unclear if the focus on minimizing cognitive adverse effects is of paramount importance [9]. A final consideration should be paid to medical comorbidities. If a patient has difficulty tolerating anesthesia, then bilateral treatment should be considered for a more expedient recovery in order to reduce the risk of further medical adverse outcomes [9]. Ideally, there should be further studies to determine the optimal ECT parameters for these dementia neuropsychiatric symptoms (aggression and agitation) [8,9].

Unique issues for ECT arose during the COVID-19 pandemic. Burhan et al. suggest implementing a triage system (with color codes) prioritizing elderly patients with severe depression for ECT, based on clinical and ethical considerations as their morbidity and mortality risks are highest, especially in light of COVID-19 mortality data [10]. Their triage system includes five groups: emergent, highly urgent, urgent but can wait 4 weeks, can be monitored without treatment with quick access provided if acuity changes, and stable long term with re-referral for any new illness episode [10]. They also suggest revising the informed consent procedure to include the added risk of infection and carrying out the ECT procedure in a negative-pressure room, to minimize infection transmission risk [10]. They also suggested ventilating and sterilizing the room between patients with a change of full personal protective gear between patients [10]. Finally, they recommend viral testing prior to treatments, with COVID-19 positive patients managed in consultation with infectious disease teams [10].

In summary, recent data provide compelling evidence that ECT is safe and efficacious in the elderly for a variety of conditions. Studies indicate that the elderly with MDD receive benefit from continuation ECT to prevent relapse following acute ECT and that this does not worsen cognitive effects. Continuation ECT provided in a symptom-titrated, algorithm-based longitudinal method is flexible, adequate and individualized for maximal efficacy and safety [2-4]. The data also show sustained remission with minimal post-series relapse (from the PRIDE Phase 2 study) and that the neurocognitive effects associated with ECT, especially with RUL-BP treatment, are modest and transient, mostly returning to baseline levels within 6 months [4]. ECT also does not appear to lengthen hospital stays in the elderly [6]. The risk of delirium has been shown to be increased with a variety of conditions and may be mitigated by ultra-brief pulse ECT and dexmedetomidine [5]. In addition to Major Depressive Disorder, ECT is beneficial in Bipolar Depression [7]. ECT is also efficacious and safe (e.g., with minimal cognitive effects) in treating severe agitation associated with dementia, with a tiered approach examining level of agitation, cognitive issues, and medical comorbidities being essential to determine which form of ECT is most appropriate [8]. Finally, in light of the COVID-19 pandemic, new protocols for triage, informed consent, and sterile treatment sessions in ECT are important and helpful [10].

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