Musculoskeletal Injury Risk and Electroconvulsive Therapy

Puneet Narang, MD[a,*]; Anum Khan, MD[b]; and Steven Lippmann, MD[c]

Musculoskeletal injuries are rare following the introduction of modified electroconvulsive therapy (ECT). We present the case of a patient with a rotator cuff injury after receiving modified ECT. This vignette emphasizes the importance of ensuring muscle relaxation prior to administering ECT, especially in high-risk patients.

Case Report

A 76-year-old white man with a history of major depressive disorder was hospitalized for decline in function. He had been prescribed sertraline for years but self-tapered off this medication 6 months prior to admission due to sexual side effects. He was depressed and expressed anhedonia, insomnia, guilt, hopelessness, low energy, anorexia, and suicidal ideation. Psychomotor retardation and speech latency were evident. Thought processes were ruminative about catastrophic events. His family reported that he was "worse than ever."

This patient was considered an appropriate candidate for ECT based on age, severity of symptoms, and need for prompt remission. After the third ECT session, he complained of a sore shoulder. He had a past history of shoulder pain for which physical therapy was prescribed. A current shoulder x-ray depicted "mild-to-moderate degenerative change in glenohumeral joint with moderate subacromial narrowing with cystic changes in proximal humerus consistent with rotator cuff pathology." The patient had previous shoulder discomfort but may have experienced recent injurious arm movement during ECT. The initial succinylcholine dose given before ECT was 1 mg/kg but was subsequently increased to 1.25 mg/kg and then to 1.7 mg/kg to ensure complete muscle paralysis. After the fifth ECT session, he complained of more shoulder pain and experienced a limited range of motion. Magnetic resonance imaging evidenced an acute, full-thickness, retracted tear involving the supraspinatus and infraspinatus tendons. Edema and inflammation were present at both myotendinous regions. Mild tendinosis involved the subscapularis; the teres minor was normal. Muscle bulk was maintained without fatty infiltration. His depressive symptoms resolved despite not receiving a full course of ECT. Due to the severity of the shoulder pathology, ECT was discontinued, and the patient was discharged from the hospital in a good mood. A subsequent surgical rotator cuff repair was required, and the patient evidenced orthopedic and psychiatric recovery.

Discussion

Since the 1930s, ECT has been an effective treatment for patients with severe psychiatric illnesses, especially when there is an urgent need for prompt treatment or when there is a poor response or intolerance to pharmacotherapy.[1] Years ago, "unmodified" ECT included no muscle relaxation and resulted in musculoskeletal injuries in up to 40% of cases.[1] Anesthesia and muscle relaxants were introduced during the 1950s and 1960s for modern "modified" ECT to provide more safety and tolerance for patients. Because of the short duration of an ECT procedure, succinylcholine is the drug of choice for the neuromuscular blockade. To block motor seizures, succinylcholine is administered before the application of an ECT stimulus, which should prevent musculoskeletal injury, even in persons with osteoporosis or spinal pathology.[2] An 85-year-old woman underwent ECT safely after vertebroplasty once the succinylcholine dose was increased from 60 mg to 80 mg to assure complete muscle relaxation.[3] Succinylcholine dosage should be increased by 40%–50% to induce complete muscle relaxation, especially for high-risk patients with osteoporosis. Also, increasing the time between the administration of succinylcholine and ECT stimulation is recommended.[3]

In our patient, ECT may have caused rotator cuff trauma. Was adequate muscle paralysis initially received? We do not know whether this musculoskeletal injury was a result of the ECT or the preexisting condition, which was then worsened by ECT. There is not much literature to provide insight into this phenomenon; however, it is important to always assess musculoskeletal risk factors and assure appropriate muscle relaxation prior to each ECT session.

[a]Department of Psychiatry, Health Partners, Saint Paul, Minnesota
[b]Hennepin County Medical Center, Minneapolis, Minnesota
[c]Department of Psychiatry, University of Louisville School of Medicine, Louisville, Kentucky
*Corresponding author: Puneet Narang, MD, Health Partners, 640 Jackson St, Saint Paul, MN 55101 (puneet.d.narang@healthpartners.com).

Prim Care Companion CNS Disord 2019;21(3):18l02384

To cite: Narang P, Khan A, Lippmann S. Musculoskeletal injury risk and electroconvulsive therapy. *Prim Care Companion CNS Disord*. 2019;21(3):18l02384.

To share: https://doi.org/10.4088/PCC.18l02384

Published online: June 6, 2019.

Potential conflicts of interest: None.

Funding/support: None.

Patient consent: Verbal consent was obtained from the patient, and information was de-identified to protect anonymity.

REFERENCES

1. Kadiyala PK, Kadiyala LD. Anaesthesia for electroconvulsive therapy: an overview with an update on its role in potentiating electroconvulsive therapy. *Indian J Anaesth*. 2017;61(5):373–380.
2. Zolezzi M. Medication management during electroconvulsant therapy. *Neuropsychiatr Dis Treat*. 2016;12:931–939.
3. Briggs MC, Popeo DM, Pasculli RM, et al. Safe resumption of electroconvulsive therapy (ECT) after vertebroplasty. *Int J Geriatr Psychiatry*. 2012;27(9):984–985.