

Case report: Bruxism associated with Serotonin Syndrome

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Abstract

Bruxism is a rare secondary effect related to drugs with potent serotonergic activity. Some of the medications that are commonly used for nociceptive, neuropathic and nociplastic pain have serotonergic activity. When medications with serotonergic activity are prescribed at normal therapeutic doses, in combination, and/or at high doses this may increase the risk of bruxism, which can cause tooth structure destruction and irreversible harm to the temporomandibular joint. Prescribers are encouraged to consider whether patients presenting with teeth grinding, jaw clenching, facial pain, headache, earache, stiffness in the temporomandibular joint and surrounding muscles, worn-down teeth, tooth loss, broken teeth or fillings may be experiencing serotonergic side-effects from their medication.

Introduction

- Serotonin syndrome consists of a triad of features including alteration of mental status, neuromuscular abnormalities and autonomic hyperactivity, which do not always present together and can vary in severity from mild to life threatening.
- Mechanisms of serotonin syndrome include increase in serotonin synthesis or release, inhibition of serotonin metabolism or uptake, or activation of serotonergic receptors.
- The incidence of serotonergic syndrome is \approx 17% in patients with migraine, depression, anxiety and panic disorder (1).
- Taking medicines with serotonergic activity can increase the risk of serotonin syndrome, particularly if taken in combination and/or at high doses.
- Bruxism, which is characterised by teeth grinding or clenching can result from increased serotonin levels.

Medicines that are commonly prescribed for pain and have serotonergic activity are listed in the table below (2):

Opioid	Antidepressant	Anticonvulsant	Triptans
Fentanyl	Selective Serotonin Reuptake Inhibitors (SSRIs)	Carbamazepine *	Triptans
Oxycodone	Serotonin and Noradrenaline Reuptake Inhibitors (SNRIs)		
Tapentadol	Tricyclic Antidepressants (TCAs)		
Pethidine			
Methodone			
Dextromethorphan			
Pentazocine			

* **Carbamazepine** is a potent CYP3A4 enzyme inducer and may lower the plasma levels of certain drugs (see BNF) and the dosage of the following medication may have to be adjusted to clinical requirement (not an exhaustive list): Buprenorphine, Methadone, Paracetamol (long term administration of Carbamazepine and Paracetamol may be associated with hepatotoxicity), Tramadol, Citalopram, Sertraline, Trazodone, and Tricyclic antidepressants.

Acknowledgements

I would like to thank the HDUHB Pharmacy Pain Team and members of the HDUHB Pain Service for their continuous unstinting support.

References

- Schuman E. Serotonin toxicity revisited. *Headache* 2009; 49 (5): 784-785.
- UKMi. What is serotonin syndrome and which medicines cause it? Date prepared 22.05.2020. Date Accessed Online 17.08.2021. Accessed via [UKMi: OA What is serotonin syndrome_FINAL2020.pdf \(sps.nhs.uk\)](https://www.ukmi.nhs.uk/what-is-serotonin-syndrome_FINAL2020.pdf).
- BNF Online Accessed 03.09.2021 via <https://bnf.nice.org.uk>.

Case Presentation

- 52 year old female reviewed by HDUHB Chronic Pain Service.
- Bloods in normal range. Weight 56Kg, BMI 25Kg/m².
- PMHx:** Chronic Peripheral Nerve Hyperexcitability (PNH) in both legs, widespread muscle twitching, cramp in both hands and legs, low mood. Hx of cramp and spasms worsened after Amitriptyline dose increase.
- Experienced bruxism during the day and night resulting in headache and teeth grinding.
- Wore a dental mouth guard at night to try and reduce teeth grinding.
- Medication Hx:**
 - Amitriptyline tablets 75mg at night and an additional 25mg in the morning in the winter months 'when the pain is worse'.
 - Diazepam 5mg tablets One at night when required for muscle spasms.
 - Naproxen 500mg tablets One twice a day.
 - Omeprazole 20mg tablets One each day whilst taking Naproxen.
 - Carbamazepine (Tegretol) 100mg tablets One twice each day (for PNH).
 - Tramulief SR 100mg tablets One twice each day for pain.

Patient Management

- Patient advised that Amitriptyline, Tramadol and Carbamazepine at normal doses can individually, and particularly in combination, increase serotonin levels.
- Increases in serotonin levels can cause a specific form of akathisia-like movement of the jaw muscles, leading to bruxism.
- There is some evidence for treating PNH with Carbamazepine.
- Patient found benefit from taking Carbamazepine for PNH.
- Carbamazepine speeds up the breakdown of Tramadol. It was possible that the patient experienced benefit from taking Carbamazepine because it was reducing Tramadol levels, thus reducing serotonergic side-effects.
- Dose of Amitriptyline slowly reduced to 50mg daily. Tramadol formulation switched to normal release product and Tramadol dose reduced to 100mg mane and 50mg nocte, with the aim of gradually reducing to stop. Pain score and mood unchanged after dose reductions BUT cramps in hands, bruxism and headaches stopped.
- Naproxen and Omeprazole stopped as no clear indication for NSAID. No change in pain or function experienced by patient after stopping NSAID but significant reduction in risk of harm and side-effects.
- Patient referred to HDUHB Pain Management Programme.
- Case report highlighted at HDUHB GP Prescribing Leads.
- An MHRA Yellow Card was completed.

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❖ Serotonin syndrome is predictable, medication-induced, & caused by serotonergic over-activity in central and peripheral nerves

- Patient reviewed by Pain Team
- Experiencing **bruxism** (grind/gnash/clenching of teeth) & had mouth guard made by dentist
- Taking **Tegretol, amitriptyline & tramadol**
- Hx of **cramp** like spasms in hands and legs after dose increase of amitriptyline
- Pain Team ↓ dose of amitriptyline & tramadol
- Pain score unchanged BUT cramps in hands and bruxism resolved completely.



Symptoms of SS
confusion
agitation, irritability
muscle twitching
bruxism
sweating
shivering
diarrhoea
seizures
arrhythmia, tachycardia
unconsciousness

❖ Serotonergic drugs, or those that inhibit metabolism of such drugs, can cause SS via overdose OR when > 1 such drug taken together

Examples of causative medicines:

SSRIs, SNRIs, MAOIs, tricyclics
Opioids
Parkinson's disease treatments
Antihistamines
Triptans for migraines

Ref: https://www.sps.nhs.uk/wp-content/uploads/2018/09/WhatIsSerotoninSyndrome_FINAL2020.pdf

Conclusion

Bruxism can be a side-effect of medication with serotonergic activity that could result in significant negative consequences for oral health. Consider the need to review/reduce/stop medication with serotonergic activity in patients presenting with bruxism.