

Topiramate and breathing: serotonin mediated?

Jan A Coebergh, neurologist
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Regarding topiramate treatment for central sleep apnea, Westwood et al. conclude: “The exact mechanism of action of topiramate is unknown.” [1] They postulate its action as a partial carbonic anhydrase inhibitor. I would like to suggest that serotonin could also play a role. An animal study found that topiramate produces a 20% increase in basal brain 5-HT activity. [2] Serotonin, sleep, and breathing have a complex relationship. 5-HT1A receptor responsive neurons in pedunculopontine tegmental neurons suppress REM sleep and respiratory motor activity.[3] Acute central fluoxetine increases normoxic ventilation and augments the stimulatory effect of hypercapnia on respiratory neurons by 5-HT2 receptors. [4] Therefore, part of the effect of topiramate on sleep apnea might be serotonin mediated.

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4. Sahin G, Guner I, Yelmen N, et al. Alterations of central hypercapnic respiratory response induced by acute central administration of serotonin re-uptake inhibitor, fluoxetine. *Chin J Physiol* 2011;54:356-366.