



Research Article

Sodium Valproate and Sodium Dimercaptopropane Sulfonate, No Binding To Tetramine and No Reduction of Blood Tetramine Level

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Summary

Tetramine is considered as a highly poisonous substance that can cause the neurological disorder to anyone who intake it within a few minutes. The clonic tonic seizure can be developed and death can be the finalized result. Here, the author assesses whether the two presently used antidotes have any possibility to reduce the tetramine level in blood level. The author tries to use a molecular docking technique to study the mechanism of sodium valproate and sodium dimercaptopropane on tetramine. Of interest, there is no detected interaction. This confirms the fact that there is no direct neutralization effect. Hence, it can explain the fact that there is no significant reduction of blood tetramine level in intoxication case after getting the two antidotes.

Key words: Tetramine, convulsion, antidote

Sodyum Valproat ve Sodyum Dimerkaptopropan Sulfonat Tetramine Bağlanmaz ve Kan Tetramin Seviyesini Düşürmez

Özet

Tetramin alındıktan bir kaç dakika sonra nörolojik bozukluk yapabilen oldukça zehirli bir madde olarak bilinir. Tonik ve klonik nöbetler gelişebilir ve ölümlerle sonuçlanabilir. Bu çalışmada güncel olarak kullanılan iki panzehirin kan tetramin seviyesini düşürebilme olasılığı değerlendirildi. Araştırmacı bir moleküler doking yöntemi kullanmayı deneyerek sodyum valproat ve sodyum dimerkaptopropanın tetramin üzerine olan mekanizmasında çalıştı. Bu yönde bir etkileşim saptanmadı. Bu durum doğrudan nötralize edici bir etkinin bulunmadığı gerçeğini doğrulamaktadır. Dahası, bu iki panzehirin alınma durumunda zehirlenme vakalarında kan tetramin seviyelerini düşürücü yönünde önemli ölçüde hiçbir etkisinin olmayacağını da açıklayabilir.

Anahtar Kelimeler: Tetramin, konvülsyon, antidot

INTRODUCTION

Tetramine is a new focused emerging poison that is reported in epidemic pattern in China and other countries. The problem of tetramine contamination in food and milk becomes the public health threaten^(3,5,9). Tetramine is considered as a highly poisonous substance that can cause the neurological disorder to anyone who intake it within a few minutes⁽⁹⁾. The

clonic tonic seizure can be developed and death can be the finalized result⁽⁹⁾.

To treatment, there are many reports on several therapeutic options for acute tetramine poisoning^(3,5,9). Sodium valproate and sodium dimercaptopropane sulfonate are the two widely mentioned antidotes⁽²⁾. However, it was recently noted that these two drugs did not effectively reduce the tetramine level⁽⁷⁾ in blood but control symptoms^(1,4,11-13). Here, the author tries to

use a molecular docking technique to study the mechanism of sodium valproate and sodium dimercaptopropane on tetramine.

MATERIAL AND METHODS

This work was based on a theoretical bioinformatics analysis. To test the possible reaction between tetramine and two studied antidotes, a standard molecular docking technique using tool namely PatchDock⁽⁶⁾ was done. The aim is to assess whether there is any predicted resulted complex. This technique is a standard technique for assessment the possible reaction between two studied molecules in reference database (Chemical Infobox, available online at <http://en.wikipedia.org/wiki/Wikipedia:CHEMBOX>)⁽¹⁰⁾. This approach is already for reliability in previously published paper⁽¹⁰⁾.

RESULTS

According to the bioinformatics analysis, it appears that there is no predicted result complex between “tetramine” and “sodium valproate” and between “tetramine” and “sodium dimercaptopropane sulfonate.”

DISCUSSION

The problem of tainted milk from China due to melamine is the recent hot issue in public health. However, there are also other problematic contaminations. The tetramine contaminated milk and food is another interesting problem. Unlike melamine, the main toxic manifestation of acute tetramine intoxication is neurological disorder. Status epilepticus can be seen after a few minutes of exposure^(3,5,9).

The treatment of acute tetramine intoxication is interesting. Fatality in affected cases is confirmed and this brings attention medical society to find for the best alternative therapeutic choice^(1,2,4,7,11-13). Here, the author assesses whether the two presently used antidotes have any possibility to reduce the tetramine level in blood level. In case that the reduction ability is possible, there must be a direct

binding interaction, as a neutralization process, between antidote and tetramine molecule. This can be traced based on advanced bioinformatics technology.

In this work, the author uses a standard molecular docking technique to test the interaction. Of interest, there is no detected interaction. This confirms the fact that there is no direct neutralization effect. Indeed, the indirect antidotal effect via receptor in brain is mentioned for the two studied antidotes^(1-2,7). Hence, it can explain the fact that there is no significant reduction of blood tetramine level in intoxication case after getting the two antidotes⁽⁷⁾. The direct removal of the tetramine before absorption, as gastric lavage⁽⁸⁾ or hemoperfusion therapy⁽⁷⁾ seems to be more appropriate in reduction or diluting the level of tetramine in blood stream.

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