

76133\_Auto\_Edited.docx

**Name of Journal:** *World Journal of Psychiatry*

**Manuscript NO:** 76133

**Manuscript Type:** LETTER TO THE EDITOR

**Sodium selenite may be not the optimal speciation as an effective therapy for arsenic-induced anxiety-/depression-like behavior**

Ren X *et al.* Sodium selenite may be not the optimal speciation

**Abstract**

Major depressive disorder is a serious and most prevalent neuropsychiatric disorder, affecting more than 350 million people worldwide. Sodium selenite (SS) was selected as selenium supplement to improve the behavior of depression-like mice induced by arsenic in this study. SS may be not the optimal speciation for selenite supplementation and the source of the sodium selenite used in the study was not disclosed. In addition, there are many mouse models of depression and anxiety, however, classical mouse model of depression was not used in this study. Thus, some questions still need further be discussed. Sodium selenite may be not the optimal speciation as an effective therapy for arsenic-induced anxiety-/depression-like behavior.

**Key Words:** Depression; Arsenic; Major depressive disorder; Sodium selenite

Ren XH, Wang XX, He LP. Sodium selenite may be not the optimal speciation as an effective therapy for arsenic-induced anxiety-/depression-like behavior. *World J Psychiatry* 2022; In press

**Core Tip:** Sodium selenite may be not the optimal speciation for selenite supplementation and the source of the sodium selenite used in the study was not

disclosed. In addition, there are many mouse models of depression and anxiety, however, classical mouse model of depression was not used in this study.

## **TO THE EDITOR**

<sup>1</sup>Major depressive disorder (MDD) is a highly disabling psychiatric syndrome associated with deficits of specific subpopulations of cortical GABAergic interneurons<sup>[1]</sup>. We were pleased that read the research article by Samad, N.T., *et al*<sup>[3]</sup>. Their work highlights that the use of selenium (Se) as dietary source and/or supplement as an effective therapy for intoxication of arsenic (As) and associated disorders. This study provides important clues to the prevention and treatment of anxiety disorders or depression. However, Sodium selenite (SS) was selected as selenium supplement to improve the behavior of depression-like mice induced by arsenic in this study. In addition, there are many mouse models of depression and anxiety, however, classical mouse model of depression was not used in this study. Thus, some questions still need further be discussed.

The mainly problem of the study is that SS as a means of Se supplementation. Se biologic activity is dependent on its metabolic disposition, for example, absorption and excretion. It was observed that selenomethionine (SeMet) in organic form is more rapidly and completely <sup>2</sup>(98 %) absorbed than sodium selenite (84 %) in inorganic form and that the liver uptake occurs faster after intake of organically bound Se than after inorganic Se (SS)<sup>[4,5]</sup>. Moreover, various excretion indices confirm that SeMet has lower excretion (4%) than SS (18%)<sup>[4]</sup>. SS was also <sup>4</sup>reported to induce DNA damage, particularly DNA strand breaks and base damage<sup>[6]</sup>. Selenium nanoparticles can also be used as a means to supplement selenium. Recent study found that selenium nanoparticle is a novel selenium species with novel biological activities, bioavailability, <sup>3</sup>and low toxicity<sup>[7]</sup>. Therefore, SS may be not the optimal speciation for selenite supplementation and the source of the sodium selenite used in the study was not disclosed.

The failure to select a suitable mouse model for depression was another problem with the study. Chronic unpredictable mild stress (CUMS) mouse model of depression was widely used<sup>[8]</sup>. Arsenic-induced depressive-like behavior can not be used as a model of depression. Whether dietary Se can alleviate CUMS mouse model of depression needs to be further determined. In addition, dietary Se supplementation for depression in large-scale clinical trials is also necessary. Arsenic-induced depression-like behavior in mice may be associated with a large number of inflammatory factors and neurotransmitter changes that were not explored in this study.

#### Conclusion

Overall, SS may be not the optimal speciation for selenite supplementation and the source of the sodium selenite used in the study was not disclosed. The failure to select a suitable mouse model for depression was another problem with the study.

# 10%

SIMILARITY INDEX

### PRIMARY SOURCES

- |          |   |                      |
|----------|---|----------------------|
| <b>1</b> | <a href="http://www.ncbi.nlm.nih.gov">www.ncbi.nlm.nih.gov</a><br><small>Internet</small>   | 20 words — <b>3%</b> |
| <hr/>    |   |                      |
| <b>2</b> | P.F. Surai, V.I. Fisinin. "Selenium in sow nutrition",<br>Animal Feed Science and Technology, 2016<br><small>Crossref</small>   | 19 words — <b>3%</b> |
| <hr/>    |   |                      |
| <b>3</b> | Awanish Kumar, Kumar Suranjit Prasad. "Role of<br>Nano-Selenium in Health and Environment", Journal<br>of Biotechnology, 2020<br><small>Crossref</small>  | 14 words — <b>2%</b> |
| <hr/>    |   |                      |
| <b>4</b> | Zheng Wang, Liyang Zhang, Tianwei Tan. "High cell<br>density fermentation of <i>Saccharomyces cerevisiae</i><br>GS2 for selenium-enriched yeast production", Korean Journal of<br>Chemical Engineering, 2010<br><small>Crossref</small> | 13 words — <b>2%</b> |

EXCLUDE QUOTES ☐ ON

EXCLUDE BIBLIOGRAPHY ☐ ON

EXCLUDE SOURCES

< 12 WORDS

EXCLUDE MATCHES

< 12 WORDS