

Letter to Editor

Potential Pharmacotherapy of *Olea europaea* (Olive) Fruit Oil against Methamphetamine-Induced Neurotoxicity

Dear Editor,

There is a substantial fret over drug addiction in Malaysia due to the close geographical proximity to other Southeast Asian countries that are known to produce a massive number of adulterous drugs (1). It is saddening to know that the utmost frequently misused drugs here in this country comprises of cannabis, heroine, and methamphetamine (METH). In addition to this, METH has been particularly expanded its popularity here in Malaysia (2). METH is derived from amphetamine that has more psychotropic properties and it produced an immense kind of indication that includes irritability, hyperawareness, physical hostility and psychomotor distress. This phenylethylamine is a strong psychostimulant that produces both addiction and dependence (3).

METH has caused a various side effects especially when it is consumed in high doses or repeatedly such as promoting drug-induced psychosis which shows the similar symptoms of paranoid schizophrenia (4). METH has strong neurotoxic effects that disrupts the usual normal neuronal communication in the dopaminergic system and influence the neuronal inflammation caused by glial activation (5).

High doses of METH will inhibit several markers of dopamine and serotonin neural loci such as 5HT uptake sites, tyrosine and tryptophan hydroxylase activities after METH administration. The decrease in dopamine in human body system are due to the excessive amount of dopamine released by METH. Dopamine itself can promote neurotoxicity that forms hydrogen peroxide and generating hydroxyl free radicals (6). The augmented extra-vesicular dopamine levels will cause oxidative stress by the production of reactive oxygen species and quinones of dopamine that further generates a long-lasting neuronal damage (7).

In this modernised era, there are a lot of natural compounds scrutinized for their therapeutic effects in

curing numerous kinds of diseases rather than using synthetic drugs (8). This includes the usage of *Olea europaea* (olive fruit), a small tree that belongs to the *Oleaceae* family, that usually grows in tropical countries that. It contains a hefty supply of phenolic compounds that are notorious to acquire various biological activities such as anti-cancer and anti-microbial. Especially its oils do have significant amounts of oleuropein which acts as an antioxidant (9).

Hydroxytyrosol in olive fruit oil also contains antioxidant properties that helps to reduce the oxidative stress and aid to guard the nerve cells from oxygen-related injure. Since there is no study, have been done yet in cellular and molecular level, the pharmacotherapy of olive fruit oil on neurotoxicity in METH induced needed to be explored for a better insight.

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References

1. Ibrahim F. Kumar N. Factors Effecting Drug Relapse in Malaysia : An Empirical Evidence. Asian Soc Sci. 2009;(2001):37-44.

2. Norliza C, Norni A, Anandjit S, Mohd Fazli MI. A review of substance abuse research in Malaysia. *Med J Malaysia*. 2014;69 Suppl A:55-8.
3. Fumagalli F, Gainetdinov RR, Valenzano KJ, Caron MG. Role of dopamine transporter in methamphetamine-induced neurotoxicity: evidence from mice lacking the transporter. *J Neurosci*. 1998;18(13):4861-9.
4. Sulaiman AH, Said MA, Habil MH, Rashid R, Siddiq A, Guan NC, et al. The risk and associated factors of methamphetamine psychosis in methamphetamine-dependent patients in Malaysia. *Compr Psychiatry*. 2014;55:S89-S94.
5. Ramirez SH, Potula R, Fan S, Eidem T, Papugani A, Reichenbach N, Dykstra H, Weksler BB, Romero IA, Couraud PO, Persidsky Y. Methamphetamine disrupts blood-brain barrier function by induction of oxidative stress in brain endothelial cells. *J Cereb Blood Flow Metab*. 2009;29(12):1933-45.
6. Yamamoto BK, Zhu W. The effects of methamphetamine on the production of free radicals and oxidative stress. *J Pharmacol Exp Ther*. 1998;287(1):107-14.
7. Kita T, Miyazaki I, Asanuma M, Takeshima M, Wagner GC. Dopamine-induced behavioral changes and oxidative stress in methamphetamine-induced neurotoxicity. *Int Rev Neurobiol*. 2009;88:43-64.
8. Md Fauzi NFA, Bakar NHA, Mohamad N, Mat KC, Omar SHS, Othman MS, Husain R, Ismail MZ. Potential therapeutic effects of thymoquinone on treatment of amphetamine abuse. *Asian Pac J Trop Biomed* 2018; 8(3): 187-188.
9. Parvaiz M, Hussain K, Shoaib M, Hussain K, Shoaib M, William G, Tufail M, Hussain Z, Gohar D, Imtiaz S. A review: Therapeutic significance of olive *olea europaea* L. (oleaceae family). *Glob J Pharmacol*. 2013;7(3):333-6.

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