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Letter to Editor

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Novel Potential of *Musa accuminata* Leaf Extract on the Treatment of Morphine Dependence

Deborah Anna Van Oosterhout[1*] and Shariff Halim[1,2]

[1]*Addiction Interest Group (AIG), International Medical School, Management and Science University, University Drive, Off Persiaran Olahraga, 40100 Shah Alam, Selangor, Malaysia*

[2]*Translational Medicine Research, International Medical School, Management and Science University, University Drive, Off Persiaran Olahraga, 40100 Shah Alam, Selangor, Malaysia*

LETTER TO EDITOR

Morphine is well known as analgesic as it is proven to alleviate severe to moderate levels of pain by blocking the receptors in the brain [1]. Opium is derived from the OPOS a Greek word for "Juice". The drug is derived from the juice of the Opium poppy *Papver somiferum* [2]. It binds to opiate receptors of the brain that alters the feeling of pain and inevitably affects parts of the brain that is involved. Opiate receptors in the brain are also controlled by other factors such as Endorphins. This is because opium's structure closely resembles that of Endorphins. Endorphins are natural products of our body which functions by suppressing pain. The most active pharmacological compound that constitutes to opium is morphine. Prolong use of morphine in sense of chronic treatment or drug abuses contribute to the side effects of opioid followed by dependent and withdrawal effects [3].

Morphine was reported to have an effect exhibited on the ventral tegmental area (VTA), more specifically the mesolimbic pathway, which causes the increase in dopamine levels in the brain subsequently activating the reward system [4,5]. The continuous release of dopamine in a chronic morphine causes the triggering of few brain areas resulting in the craving of the drugs obsessively. An individual then becomes dependant and results in consuming opiates in order to counteract the withdrawal symptoms. This withdrawal symptom occurs when a change in the locus coeruleus due to the absence of exogenous opioids which in tun stimulates the brain to exhibit the release of large amounts of noradrenaline. Excessive amounts of this noradrenaline in turn causes muscle cramps, diarrhoea, increased in heart rate and blood pressure, anxiety and widening of pupils and air passages of the lung [6]. One of

the proposed causes of opioid dependence is increasing of oxidative stress produced by chronic morphine. Morphine is a highly addictive drug, prolong use of this drug exhibits side effects such as neuronal dysfunction and toxicity, kidney dysfunction, apoptosis and oxidative stress [7]. Opioid drugs such as morphine is able to exert an imbalance on the level of anti-oxidant. Oxidants and anti-oxidants imbalances are a result of prolong use of morphine which will result in the formation of dependence and withdrawal in patients. Overtime This therefore will lead to the formation of oxidative stress. Oxidative stress will result in the development of carious chronic and degenerative illnesses [8].

Morphine is a highly addictive narcotic drug which is used for the treatment of moderate to severe pain. Prolong use of morphine induces side effects which includes developing an addiction followed by a dependent and withdrawal effect. Morphine is seen to have an effect exhibited on the ventral tegmental area (VTA), more specifically the mesolimbic pathway, which causes the increase in dopamine levels in the brain activating the reward system. An individual then becomes dependant and results in consuming opiates in order to counteract the withdrawal symptoms. Studies have also shown that morphine increases cell apoptosis. This is also supported by in vitro and in vivo studies done [9-12]. Studies have also shown that with acute treatment of morphine (0.1–100 μM) for at least 30 min will increase extracellular dopamine levels in the brain [13]. It is also found that morphine increased in extracellular dopamine levels in the nucleus accumbens in rats. Even after repeated morphine treatment, the sensitization of locomotor activity is also associated with an increase of dopamine release within the nucleus accumbens [14]. Furthermore, biochemical studies have shown that morphine not only causes a significantly decrease in dopamine and norepinephrine levels in areas of the brain such as the cortex striatum, thalamus/hypothalamus and cerebellum but also reduced weight of rats in chronic treatment administration. However, serotonin levels were increased in these brain regions. However, there is evidence supporting that morphine not only activates the relevant receptors but also promotes oxidative stress under certain conditions. Most importantly oxidative stress seems to play a role in significantly in the development of different pathological processes.

Nowadays, many natural compounds in worldwide are explored for their therapeutic effects in healing various diseases instead of chemical drugs [15]. These include *Musa accuminata* leaf, a species of banana native to Southeast Asia. Previous studies have reported the therapeutic and benefits of Musa Acuminata. The pseudostem of

banana leaves is utilized for its fibre properties. The young leaves of the plant can be used as poultice used for skin irritations [16]. *Musa accuminata* proposes some qualities proposes such as anti-oxidant and anti-cancer. Natural plant polyphenols are compounds formed naturally from the formation of various chemical structures. Polyphenols are said to reduce neurodegenerative diseases and is said to promote anti-oxidative properties which is a result of oxidative stress [17]. The bioactive compounds found in bananas are said to have a higher antioxidant amount as compared to some herbs, berries, and vegetables. This level of antioxidant also varies and increases as the fruit matures [18].

Musa accuminata leaf extract contains polyphenols that are beneficiary for human health. Therefore, the purpose of this study is to determine and apply the elements of *Musa accuminata* properties of anti-oxidants on morphine dependent rats with high levels of oxidants due to withdrawals symptoms of morphine. However further studies are needed for a better understanding [19-22].

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