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## Comparison between the efficacy of vinpocetine, pomegranate, vitamin b complex, vitamin e in providing protection against parkinsonian syndrome induced by manganese in rats

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**Background:** Parkinson's disease (PD) is the most common neurodegenerative movement disorder characterized by insufficient production of dopamine as well as motor and cognitive decline. Excessive exposure to Manganese (Mn) is associated with extrapyramidal motor disorder similar to PD. Vinpocetine (Vin) has a neuroprotective effect which claimed to enhance brain neurotransmitter concentration, glucose and oxygen consumption as well as cerebral metabolism and blood flow. Pomegranate (POM) has been extensively referenced in medical folklore due to its dopaminergic neuroprotective effect as well as the powerful antioxidant, anti-inflammatory and antiapoptotic activity. Vitamin B (Vit B) complex also has ability to improve brain blood circulation and promote neurotransmitters synthesis, while Vitamin E (Vit E) has a neuroprotective effect by scavenging free radicals and preventing neuronal damage

**Objective:** To compare between the impact of Vin, POM, Vit B complex, Vit E and their combinations against parkinsonian syndrome induced by Mn in rats.

**Methods:** Rats received daily for 4 weeks; Saline for normal group or MnCl<sub>2</sub> (10mg/kg IP) either alone for control PD model or in combination with Vin (20mg/kg PO), POM (150mg/kg PO), Vit B Complex (8.5mg/kg PO), Vitamin E (100mg/kg PO) or their combinations. Behavioral tests as Grid, Bar, Swimming, Open-field and Y-maze were used. In addition to histopathological examinations, biochemical examinations for brain monoamines, AChE, BDNF, GSK-3, Glutamate, GABA, INOS, Cox2 as well as for neuroinflammatory, apoptotic and oxidative markers were also evaluated.

**Results:** All used treatments especially Vin and POM improved motor, memory and cognitive decline induced by Mn. However, combination of treatments showed more pronounced improvements as indicated by the increase in monoamines, BDNF and Glutamate together with the decrease in AChE, GSK-3, GABA, neuroinflammatory, apoptotic and oxidative stress markers (MDA, NO, INOS). These results were highly confirmed by histopathological examination.

**Conclusion:** Neuronal degeneration as well as behavioral changes induced by Mn was partially improved by each of Vin, POM, Vit B complex or Vit E with more advantages to Vin and POM but their combination showed more pronounced protection from Parkinsonian syndrome induced by Mn than the solo treatment.

### Biography

Azza A Ali has completed her PhD specialized in Pharmacology and Toxicology from Faculty of Pharmacy, Cairo University, Egypt. Her postdoctoral studies included different scientific aspects especially on neurodegenerative disorders; she also developed research line of behavioral pharmacology in Egypt. She is member of many scientific societies as (AAPS) and Alzheimer's Association (ISTAART). She is also Editorial Board Member of many international Journals as Brain Disorder & Therapy, Acta Psychopathologica, EC Pharmacology and Toxicology as well as Organizing Committee Member and Chairperson at many international Conferences as the International Conference on Brain Disorders & Dementia Care, Canada (2017) and International Conference on Parkinsons Disease & Movement Disorders, USA (2017). She published more than 60 papers in reputed journals, supervised and discussed more than 90 PhD and MSc thesis and actively participated by oral and posters presentations at many international conferences especially on Alzheimer's disease and Dementia as well as on Parkinsons disease as Dementia Conferences (2015, 2016), Alzheimer's Association International Conference (AAIC 2016, 2017) and Parkinsons Conference (2017). She has many appreciation certificates and certificate of best presentation award at 19th International Conference on Environmental Pollution and Pollution Control, London, UK (ICEPPC 2017). Now she is a Head of Pharmacology and Toxicology Department at Al-Azhar University, Egypt.

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