

Intricacies of Lead Exposure to the Cardiovascular and Nervous System

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Lead poisoning had been a prominent issue in day to day life of many people around the world. Lead poisoning was seen in almost every 3rd world country. Though in the United States, it doesn't shy away from the issues that occurred in Flint, Michigan. In items such as mobile devices, pencils, and even in the water around us, the exposure of lead seems to be hidden in plain sight. Due to lead's chemical properties, the human body is very easily susceptible to it. Inhalation through vapor or consumption of contaminated water, lead exposure and its toxicity had shown heinous effects. In human anatomy, every single function or movement that occurs is always affected. Even so, other disparities are introduced due to toxicity. Higher blood pressure, brain damage, and Anemia are but the many disparities that come from lead poisoning. Little is known about the reversal of lead poisoning, or the cancellation of it as a whole, but this article serves to expose why this element needs to be contained.

INTRODUCTION

Lead poisoning can certainly cause Anemia due to the inhibition of the ability to produce hemoglobin; losing red blood cells. With very little study of anemia, it is a blood disorder in which the blood's ability to carry oxygen is greatly reduced, or even having blood production to shut down entirely. The blood factory shutting down does vary case by case depending on certain amounts of lead exposure. When having anemia, symptoms display itself in a slow manner, or even no sign of symptoms at all. Weakness, fatigue, and shortness of breath are indicators of onset anemia. However, as this condition progresses, more major symptoms are shown, such as: yellowing of skin, heart palpitations, and stool color change (NHS 2021). Whatever may be the case, lead exposure is a very problematic and discrepant poison to the body. Millions all over the world live day by day next to power plants, machinery, and contaminated water supplies that ultimately lead to this problem. Even though that there aren't any know cures or reversal methods on lead poisoning, it still is very important to expose lead and let the world know that due to frequent lead exposure from drinking water and inhalation of contaminated water vapor, millions around the world have encountered effects of lead poisoning such as: cardiovascular complications around the world, brain damage, and Anemia.

Blood Pressure Elevation

Through 2013 to 2015, blood levels of children within the area were assessed, also the locations were pinpoint through spatial analysis. From what the researchers have gathered in data, there were incidences where increased blood levels increased from 2.4% to 4.9% with P level less than 0.05.

- study consisted of 1473 children that lived within Flint, while 2202 children that lived outside of the city.
- The researchers figured that elevated levels had no significant changes when studying children outside of the city, these were 0.7% to 1.2%. However, in the areas where there were higher concentrations of lead (Flint), elevated blood pressure increased from 4.0% to 10.6% in children.

Decrease in Brain Development

Environmental lead exposure is connected to many neurological deficiencies such as intelligence, memory, processing speed, comprehensive skills, and motor skills.

- Between 1979 to 1984, pregnant women were enrolled in CLS (Cincinnati Lead Study) in neighborhoods that had high amounts of childhood lead poisoning. With 5 year increments, the children were systematically examined via MRI scans. MRI scans assessed gray matter and cerebrospinal fluid. Blood lead levels were also measured. Based upon the data, the researchers have reported that greater mean in childhood lead concentrations were associated with a great decrease in gray matter

Concurrently, Studies that focused on epidemiology of lead poisoning have poised towards the idea of lead exposure correlating with autism in older aged. With lead poisoning being known for factoring behind developmental issues in children, there seems to be the possibility of lead being able to shut down important mechanisms and pathways that are associated with maintaining the body.

RESULTS

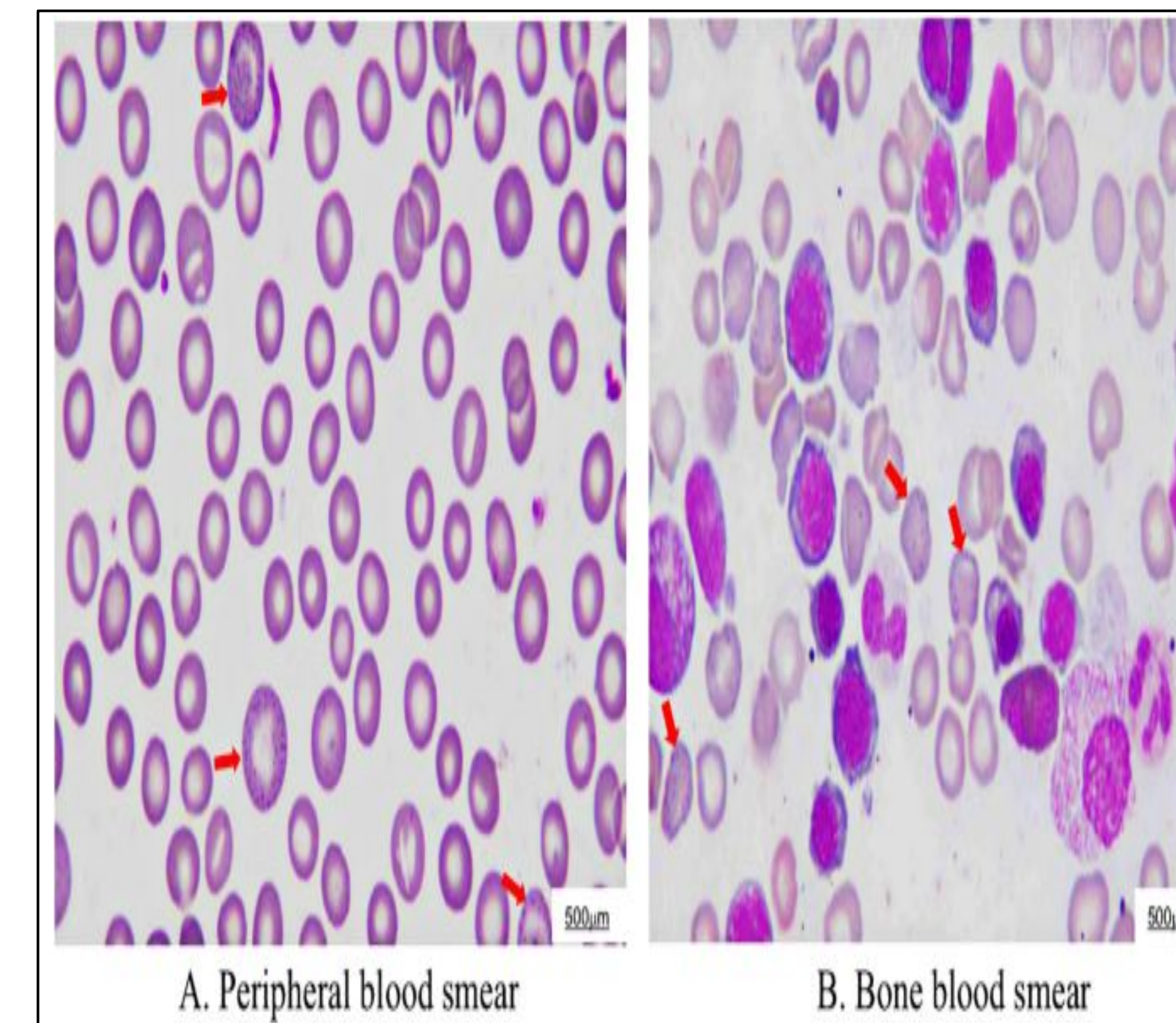


Figure 2. Hematological manifestations. Recorded from resident in Flint, Michigan.

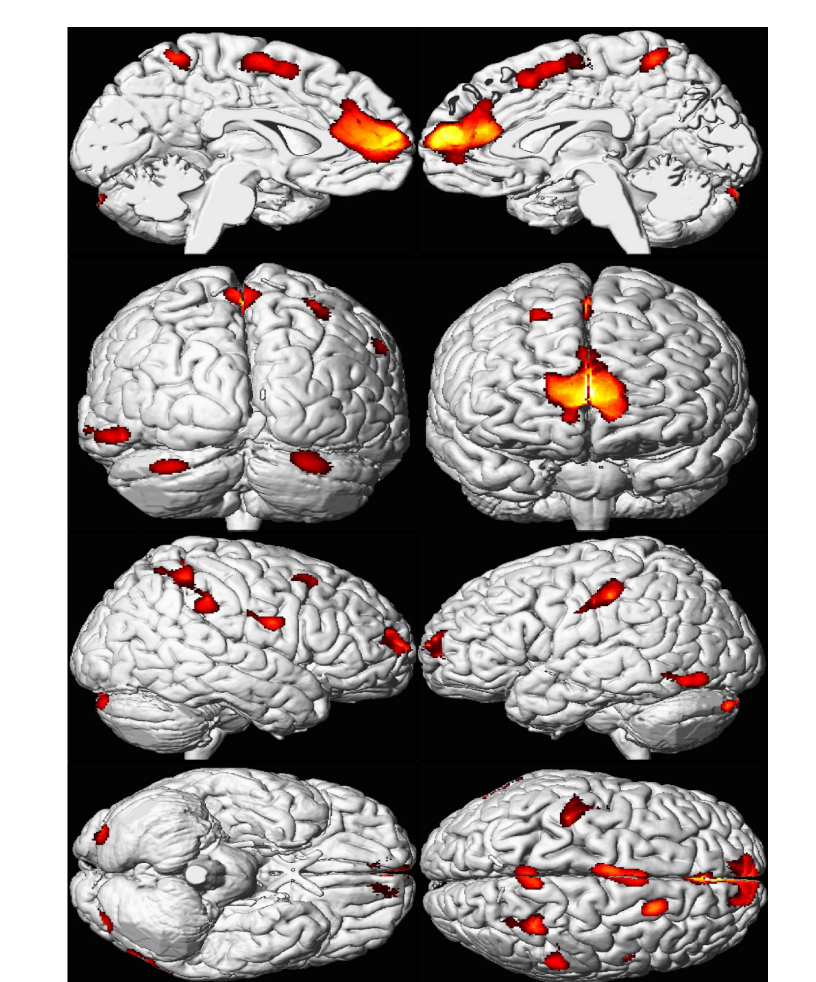


Figure 3. Brain matter of lead exposed patients

Final Remarks

Lead has been an on-going issue for the general populous. To many, lead is a necessity or even a commodity. However, many see it as a deterrent. Moving forward, there must be an alternative for this product to better suit this planet.

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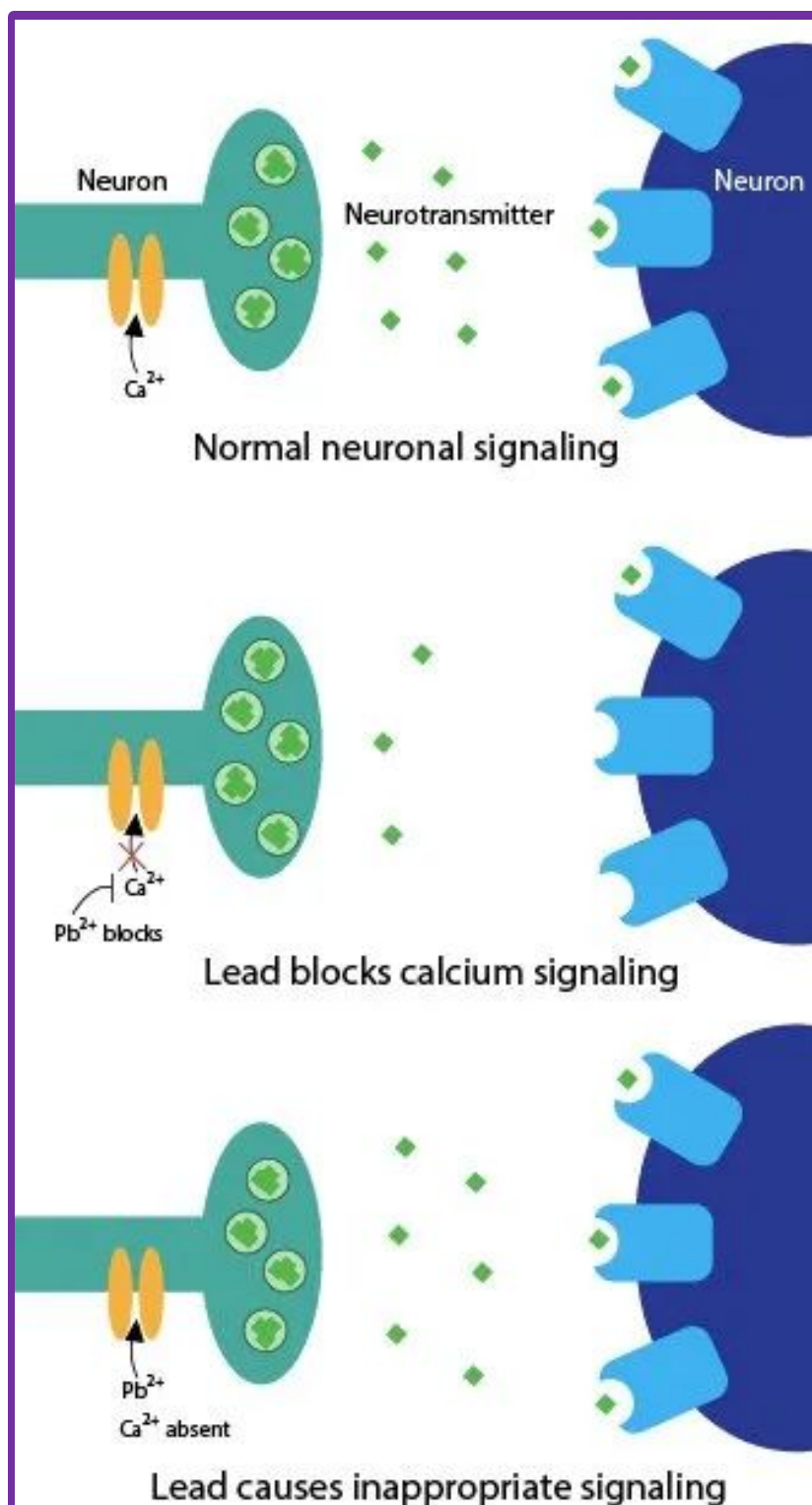


Figure 1. Biology of lead exposure. Lead alters neurotransmitter release. When calcium (Ca^{2+}) enters a neuron, the neuron releases neurotransmitter (green diamonds) to send a signal to the next neuron. Lead (Pb^{2+}) can interfere with this process in two ways. When lead blocks calcium entry into the neuron, the neuron releases less neurotransmitter and sends a weaker signal to the next neuron. Lead can also cause aberrant neurotransmitter release when calcium is not present.