ISSN 2598-3180 (Online)
JOURNAL OF MIDWIFERY
Research and Practice

Article

Overview The Presence of Plumbum Urine In Women Operators and Non-Operators of Fuel Oil Pump Wells (SPBU) in Padang City

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SUBMISSION TRACK

Recieved: March 15, 2024
Final Revision: June 20, 2024
Available Online: June 30, 2024

KEYWORDS

Gas Station Operator, Plumbum, Urine

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A B S T R A C T

Introduction: Gas station operators are a group of workers who are at risk of exposure to lead, also known as the heavy metal lead, which can poison the human body in the long term.
Objective: This study aims to determine the description of lead levels in the blood of gas station operator officers in Padang City.
Methods: This type of research is descriptive with a cross sectional approach, with 20 subjects as gas station operators in Padang City and using a sampling technique, namely consecutive sampling. The research began by providing informed consent and a questionnaire. Next, the lead levels in the respondent's urine were checked using an Atomic Absorption Spectrophotometer.
Result: A total of 20 respondents from gas station operators in Padang City, who were willing and met the requirements for sample inclusion criteria, which had been determined by the researcher. (MBIE, 2013). The data obtained is presented in descriptive and tabular form.
Conclusion: Lead levels in urine Female officer operating a fuel oil well pump (SPBU) in Padang City has not exceeded the set safe limit.

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I. INTRODUCTION

Exposure to lead in the human environment has increased. This can be caused, among other things, by the presence of transportation activities in the community environment, especially in urban areas. Exhaust substances in transportation fumes are one of the sources that trigger air pollution, which is indicated by the level of traffic density. Apart from transportation activities as a source of high concentrations of carbon dioxide (CO2) gas in Padang City, industrial activities, waste burning and road paving in the Padang City area. This activity plays a role in contributing to the concentration of carbon dioxide gas (CO2) in Padang City. All waste gas resulting from combustion using fossil fuels (petroleum, coal, natural gas) contains carbon dioxide gas (CO2), waste gas that is inhaled and enters through exhalation will increase lead levels in a person's blood (Asmara, 2016).

To The presence of lead in the environment, one of which is obtained from exhaust gas emissions from transportation vehicles that use fuel containing the elements O3 (ozone), CO (carbon monoxide), NO2 (sodium dioxide), SO2 (sulfur dioxide), Pb (lead or lead and About 85% of PM (particulates) that pollute the air in Indonesia come from motor vehicle emissions and affect the blood lead levels of people who have high activity on the streets. Groups are at high risk of exposure to lead pollutants in the air, such as traffic police. street vendors, beggars, and petrol station (SPBU) officers (Klopfleisch et al., 2017)

Motor vehicle fuel consumption consumption is also increasing along with the increasing number of vehicles each year, this has an impact on increasing the amount of pollution released into the air. Each liter of premium produced reaches 11,515,401 KL. Every liter of premium produced contains 0.45 grams of lead, so the amount of lead released into the air is 5,181,930 (Sunu, 2001).

Motor vehicle fuel oil is knownMost of them use premium gasoline containing Tetra Ethyl Lead (TEL) or Tetra Methyl Lead, which functions to increase the octane number so that the engine doesn't tickle. Through combustion, 98% of Tel will be converted into lead bromide which will be released in the form of steam containing heavy metals, this will worsen air quality and the risk of accumulation of Lead in the human body (Laila and Iting, 2013)

Lead enters the human body in various ways, including through breathing, the digestive tract, and even the dermal contact channel. However, an important route for human exposure to Lead is through inhalation (Rahmi, 2017). Lead can cause increased production of reactive oxygen species (ROS). ROS is a derivative form of oxygen that occurs when it reacts with electrons. The main source of ROS is the result of cellular respiration and metabolic processes. Apart from that, ROS can also come from radiation. ROS have a crucial role in human physiological and pathophysiological processes. ROS play a role in immune function, thyroid, cognition and modulation of nutrient sensors and lifespan. In relation to health, ROS is related to the implications of several diseases such as cancer, cardiovascular disease (including hypertension), neurological diseases, emotional disorders and psychiatric diseases (Santoso, 2010). Women who work in pottery factories, where exposure to lead is very high, have a greater risk of miscarriage, stillbirth, and premature birth (Sodhi, 2015).

Most gas stations sell vehicle fuel that contains Tetra Ethyl Lead (TEL) or Tetra Methyl Lead as contained in premium gasoline, which functions to increase the octane number so that the engine does not tickle. Through burning, 98% of Tel will be converted into lead bromide which will be

released in the form of steam containing heavy metals which will worsen air quality and the risk of lead accumulation in the human body (Laila and Iting, 2013)

Female officer operating a fuel oil well pump (SPBU) is a group of women of childbearing age who are at risk of being exposed to Plumbum, which is very dangerous for their health, including their reproductive health. Lead is contained in gasoline and gas emissions from motor vehicles waiting in line to refuel their vehicles, and also the position of gas stations which are usually close to the main road increases the risk of exposure to heavy metals. Plumbum from oncoming vehicles. Apart from the location of gas stations, which are mostly located in areas or roads that are heavily passed by public and private vehicles, this can increase the risk of gas station operators being exposed to lead particles (Almunajiat, et al, 2016)

The diagnosis of Lead poisoning already means toxicity if urine Lead levels are found > 0.2 mg/l. Meanwhile, the normal limit for lead levels in urine is 0.15 mg/l or 150 µg/dl (Ministry of Health of the Republic of Indonesia, 2002). Based onThe research results of Hastuti (2009) reported that the lead levels studied from the urine of street children in the city of Yogyakarta showed an average urine lead level of 0. 2-0. 12 mg/L. These results have levels that exceed the normal threshold value of the MBIE (Ministry of Business, Innovation, and Employment) standard, namely 0.15mg/L (MBIE, 2013)

Lead excretion through urine is 75-80%. According to Norberg (1986) states that the process of lead excretion through the kidneys is through glomerular filtration. Lead levels in urine are a reflection of recent exposure so urine lead examination is used for occupational exposures (Nordberg, 2007)

Based on the background above, the researcher wants to know "K's overviewPresence of Urine Plumbum in Female Operators and Non-Official Fuel Pump Well Operators (SPBU) in Padang City."

II. METHODS

Researchan is a descriptive study with a cross-sectional design and was conducted in monthsJune to November 2019. The sample is urinefemale officer operating a fuel oil well pump (SPBU) in Padang City. The equipment used is a small urine collection tube, an atomic absorption spectrophotometer (SSA). 100 mL measuring flask, 50 mL measuring flask, screw bottle, Micropipette, Blue type, 10 ml measuring pipette, Push ball, COD Reactor, large reaction tube, funnel, Whatman paper no. 40, Sample cup. The materials or reagents used are urine, 1000 ppm Pb solution, boiling stones, concentrated HNO3 solution, and distilled water.

Researchan started by conducting a survey at several gas stations in Padang City, explaining the purpose of the research, asking about the willingness of female gas station officers in Padang City and then providing informed consent to respondents and providing an explanation regarding checking Plumbum levels. The sampling technique used in this research was consecutive sampling. 3 ml of the respondent's urine was collected, while the lead level examination was carried out at the Unand environmental engineering laboratory.

III. RESULT

Based on data processing resultsl This research can be seen in the table, as follows:

Table 1. Frequency Distribution of Respondents' Age Characteristics

Age Characteristics	f	%
< 20 years	4	10
20-35 years	36	90
> 35 years	0	0
Amount	40	100

Source: Processed primary data, 2019

Table 1 shows that the majority of respondents were in the 20-35 year age group (90%), while a small proportion of respondents were in the > 20 year age group (10%).

Tabel 2. Frequency Distribution of Respondents' Age Characteristics

Educational Characteristics	f	%
elementary school	0	0
junior high school	1	2.5
high school	39	97.5
PT	0	0
Amount	40	100

Source: Processed primary data, 2019

Table 2 shows that almost all respondents have a high school education level, namely 39 respondents (97.5%), while a small proportion of respondents have a junior high school education level, namely 1 respondent (2,5%).

Tabel 3. Frequency Distribution of D Lead Contentalam Responder's Urine Female gas station attendant

Urine Lead Levels	Ptgs gas station		Non Non Ptg Gas Station		Total	
	f	%	f	%	f	%
Tall	12	65	1	5	13	32.5
Low	8	35	19	95	17	67.5
Amount	20	100	20	100	40	100

Source: Processed primary data, 2019

Table 3 shows that the highest urine Pb levels of respondents were found in the group of female gas station attendants with 12 respondents (65%), while the respondents with low urine Pb levels had low urine Pb levels, namely 14 respondents (35%) and the non-gas station attendant group.

IV. DISCUSSION

Heavy metal particles Lead (Pb)In everyday life it is widely used as packaging material, water pipe lining, household tools and decoration. In the form of lead oxide, it is used as a pigment or coloring agent in the cosmetics industry and ceramics industry, some of which are used in household appliances. In the form of inorganic aerosols it can enter the body through inhaled air or through food such as vegetables and fruit (Gusnita D, 2012)

Plumbum canfound in exhaust gas from motor vehicles. When you start a motorized vehicle, it releases pollutants into the air which have a negative impact, both on the environment and human health. Plumbum emissions as exhaust from motor vehicle exhaust fumes enter the air in gas form. Lead emissions are a side effect of combustion that occurs in vehicle engines originating from the compounds Tetra Ethyl and Tetra Methyl Lead which are added to the fuel (Ati and Murbawani, 2014)

Based on the results of this study, it was reported that the majority of respondents were in

the 20-35 year age group (90%), while a small proportion of respondents were in the > 20 year age group (10%).

According to Rahmi (2017), it was reported that lead can enter the human body through breathing, the digestive tract, and even through dermal contact. However, the most exposure to lead enters the body through inhalation. Apart from that, Qoriah (2015) also explained that age is also a determining factor in a person's body condition. The older a person gets, the more they experience a physiological decline in all the functions of their body organs.

This is also supported by the results of Fa researchUziah (2012) reported that the body's ability to neutralize toxic substances depends on age. The older you get, the greater the risk that a person's body will be affected by toxins, which may be accidentally inhaled or ingested. As you get older, your ability to neutralize toxic substances in the body decreases, including Plumbum. Apart from reducing the body's resistance due to increasing age, toxins that enter the body either through breathing or from food are not able to neutralize them properly.

Based on the results of this research, it was reported that almost all respondents had a high school education level, namely 39 respondents (97.5%), while a small proportion of respondents had a junior high school education level, namely 1 respondent (2.5%).

This coincides with research conducted by Hastuti (2009) who examined the levels of Plumbum (Pb) in the urine of street children in Yogyakarta City, and obtained research results showing that the average level of Plumbum (Pb) in the urine of street children in the City of Yogyakarta was 0.2234 mg/l. The urine has lead levels that exceed the normal threshold, namely ≥ 0.15 mg/l.

Education is part of determining a person's abilities. The higher a person's education will determine the quality of work in the world of supporting the family economy. The better a person's level of education, the better the standard of living and welfare in terms of utilization of human resources (Liow, 2010).

V. CONCLUSION

Based on this research it can be concluded thatMost respondents had low urine lead levelsThe safe threshold limit was set by the CDC (Centers for Disease Control and Prevention) in 2011, i.e. normally < 10 µg/dl.

For peIn future research, different samples such as saliva,hair and blood can be used to determine factors that influence the description of lead levels in the body of women of childbearing age.

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