STUDY OF COMBINATION EFFECTS OF NOISE POLLUTION AND HEAVY METALS ON HUMANS CASE STUDY - PETROL PUMP STATION IN THE WEST TOWN OF MASHHAD

*Seyed Mohammad Vakili¹, Ava Mohammadi Deh Cheshme¹, Hosein Namdari¹, Milad Fatemi², Mohsen Kordi Todzil³, Rasol Ghiasi Salmani Tabas³, Jasem Sakhi¹ and Seyed Abolghasem Mir Hoseini⁵

¹Department of Environmental Pollution, Meybod Branch, Islamic Azad University, Meybod, Iran
²Department of Management Pollution, Meybod Branch, Islamic Azad University, Meybod, Iran
³Department of Tehran Branch, Nonprofit Institution of Higher Education Noore Touba, Tehran, Iran
⁴Department of Jurisprudence and Law Meybod Branch, Islamic Azad University, Meybod, Iran
⁵Department of Environment, Islamic Azad University, Meybod, Iran

*Author for Correspondence

ABSTRACT
The main aim of this study was to examine the role of vehicles that caused noise pollution by traffic in urban environments and their effects on workers Fuel Station. In this study, two petrol stations were selected. In the first station which is placed in the urban environment and is exposed to noise pollution, Blood-pressure samples were taken From 6 people who have been worked 15 months. In the second station that is located adjacent to the highway and is exposed to the less noise pollution, numbers of 6 people with equal conditions respect to treated environment were selected for taking blood samples. Also an Audiometer (tes-1358) was used to measure the external noise pollution at four sides of both stations and for 30 minutes for each side. The results showed that blood lead levels in people with experience in environments polluted have a small difference but it is thinkable. The effects of noise pollution is visible on the more absorption of lead in the treated group compared to the control group. We need to more study on individuals with high work experience to know the importance of sounds in the absorption of lead in the blood of persons.

Keywords: Noise Pollution, Mashhad, Heavy Metals, Combination Effects

INTRODUCTION
Acoustic noise and particle air pollution are among the most prominent environmental stressors in cities. They often result in cardiorespiratory diseases among urban dwellers and thus counteract important urban health targets. In cities, both stressors often occur simultaneously because their main source is urban traffic. Nevertheless, little is known about the combined exposure of acoustic noise and particle air pollution and their spatial distribution in urban residential areas (Nicol et al., 2014). Today noise pollution is a global problem in particular for industrial workers and damage resulted from noise is amongst the 10 first harmful damages reported (Karlidag et al., 2002). Exposure to noise results in some complications such as hearing loss, cardiovascular diseases, high blood pressure, mortality risk increase, serious physiological effects, headache, anxiety and nausea (Manikandan et al., 2005). As chronic exposure, acute exposure can lead to the production of extra free radicals like superoxidase, catalase, and glutathione peroxidase (Manikandan et al., 2005). Naturally, there is an approximate balance between the production of compounds derived from oxygen (oxidants) and the amount of antioxidant defense system activity. If the balance is broken for the compounds derived from oxygen, oxidative stress will be induced and results in biological damage (Abuja et al., 2001).

MATERIALS AND METHODS
In this study, two petrol stations were selected in the first station which is placed in the urban environment and is exposed to noise pollution. Blood-pressure samples were taken From 6 people who have been worked 15 months. In the second station that is located adjacent to the highway and is exposed...
to the less noise pollution, numbers of 6 people with equal conditions respect to treated environment were selected for taking blood samples. Also an Audiometer (tes-1358) was used to measure the external noise pollution at four sides of both stations and for 30 minutes for each side.

Table 1: Level of noise pollution in Fuel Station

<table>
<thead>
<tr>
<th>Location</th>
<th>The level of noise pollution in two stations</th>
<th>Standard of sound in workplace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the urban environment</td>
<td>114/59</td>
<td>70</td>
</tr>
<tr>
<td>Adjacent to the highway</td>
<td>83/58</td>
<td>70</td>
</tr>
</tbody>
</table>

![Figure 1: The level of noise pollution in two stations](image)

Table 2: Blood lead level in two control and treatment environment

<table>
<thead>
<tr>
<th>Staff</th>
<th>Shift work</th>
<th>The amount of work experience in month</th>
<th>Blood lead level in polluted environment in μg/lit</th>
<th>Blood lead level in unpolluted environment in μg/lit</th>
<th>Standard amount of lead in human blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>operator</td>
<td>15</td>
<td>7/21</td>
<td>2/33</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>operator</td>
<td>15</td>
<td>11/82</td>
<td>3/5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>operator</td>
<td>15</td>
<td>9/61</td>
<td>1/81</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>operator</td>
<td>15</td>
<td>4/27</td>
<td>4/79</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>operator</td>
<td>15</td>
<td>8/73</td>
<td>5/5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>operator</td>
<td>15</td>
<td>5/91</td>
<td>4/99</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
RESULTS AND DISCUSSION
The effects of noise pollution is visible on the more absorption of lead in the treated group compared to the control group.

![Figure 2: Blood lead level in polluted environment in μg/lit](image)

![Figure 3: Blood lead level in unpolluted environment in μg/dl](image)

**Results**
The results showed that blood lead levels in people with experience in environments polluted have a small difference but it is thinkable. We need to more study on individuals with high work experience to know the importance of sounds in the absorption of lead in the blood of persons.

To reduce the absorption of lead and its effects on workers should have the following apply:
1. Using mask and placing queuing lines of cars outside the entrance stations
2. Planting heat resistant plants around the plant to reduce of noise pollution
3. Substitution of time standing beside dispensers randomly by operators

ACKNOWLEDGEMENT
We are grateful to meybod University, meybod branch authorities, for their useful collaboration.

REFERENCES


