



ELSEVIER

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib



Data Article

Data on the environmental exposure to lead in Iran



Norouz Mahmoudi^{a,b}, Ali Mohammad Latifi^c,
Mohammad Ali Amani^c, Hossein Masoumbeigi^b,
Ghader Ghanizadeh^{b,*}

^a Department of Environmental Health Engineering, School of Public Health, Iran University of Medical Sciences, Tehran, Iran

^b Health Research Center, Life style Institute, Baqiyatallah University of Medical Sciences, Tehran

^c Applied Biotechnology Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran

ARTICLE INFO

Article history:

Received 12 May 2018

Received in revised form

14 August 2018

Accepted 22 August 2018

Available online 28 August 2018

Keywords:

Environmental exposure

Heavy metals

Lead

Blood lead level

ABSTRACT

The data was obtained to present the environmental and occupational exposure to lead in Iranian populations based on the published articles. To acquire the data, online resources including Google Scholar, Magiran, SID, Iranmedex, PubMed, and Science Direct were searched and 104 articles were found out of which 70 that focused on the level of lead in blood, urine, milk, and hair of different Iranian populations were selected. Since the results of the studies were not homogenous, it was not possible to carry out a meta-analysis. The average blood lead level (BLL) among workers, ordinary people, patients with specific diseases, addicts, and pregnant women, women in labor, infants, and children are presented in this article. The average BLL was compared to the standards.

© 2018 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

* Corresponding author.

E-mail address: qanizadeh@yahoo.com (G. Ghanizadeh).

Specifications Table

Subject area	Environmental Health
More specific subject area	Public Health
Type of data	Tables
How data was acquired	The data was collected from different databases including Google Scholar, Magiran, SID, Iranmedex, PubMed, and Science Direct. All articles published by March 20, 2014 were included.
Data format	Raw and analyzed
Experimental factors	Based on their type and exposure intensity, the studies were classified into five groups: 1) workers and ordinary people, 2) patients with specific diseases, 3) addicts, 4) pregnant women and women in labor, and 5) infants and children.
Experimental features	Out of the 104 articles, 70 that were referable were used.
Data source location	Tehran, Tehran province, Iran.
Data accessibility	Data are included in this article

Value of the data

- The data provides information on the level of lead exposure among different Iranian groups, and is important for scientific community.
- The data clarifies protective, managerial, and policy-making measures of the risks involved with lead exposure more than before.
- The data can be useful as it collects all the available information about the blood lead level amount Iranians.

1. Data

Tables 1–5 present the data of the studies in different populations. This data is extracted from 70 articles [1–70]. As indicated in the tables, the level of the measured lead is different in different groups, with a higher level belonging to the addicts. The concentration levels of lead in blood were expressed in micromole per liter ($\mu\text{mol/l}$), which was turned into microgram per deciliter ($\mu\text{g/dl}$) by multiplying them by the constant of 20.72 (Tables 2–5).

2. Experimental design, materials and methods

The data is based on the articles that were sporadically carried out on certain groups and different cities and published in domestic and foreign journals. The articles were selected from different databases including Google Scholar, Magiran, SID, Iranmedex, PubMed, and Science Direct. While searching the articles, keywords like lead, occupational exposure to lead, lead measuring, human lead contamination, BLL, blood lead level, lead poisoning, lead toxicity, lead exposure were used and their Persian equivalents in Persian websites. All articles published by March 20, 2014 were included. First, all articles on lead exposure carried out in Iran were collected. At this stage, all articles that contained the mentioned keywords in their title or abstract were included in the primary list. Afterwards, a checklist of necessary study information, including study location, study year, sample environment, sample size, and average blood lead level (BLL), was prepared for final evaluation. Searching and extracting of the data was independently carried out by one person. A total of 104 articles that were available by March 20, 2014 were examined. Out of the 104 articles, 70 that were referable were taken used [1–70]. Due to the heterogeneity of the collected data, it was impossible to carry out a meta-analysis. Based on their type and exposure intensity, the studies were classified into five groups: 1)

Table 1

Studies related to mean blood lead concentration among adults (workers and ordinary people) in Iran.

#	Study location	Sample environment	Sample Size	Lead level	References
1	Kermanshah	Blood	150 workers of Kermanshah oil refinery 70 workers of a textile factory near the refinery	35.30 ± 6.68 µg/dl 19.7 ± 3.91 µg/dl	[1]
2	Tehran	Blood	497 workers of a battery recycling plant	43.31 ± 17.95 µg/dl	[2]
3	Isfahan	Blood	142 workers of battery manufacturing plant	7.59 ± 2.75 µg/dl	[3]
4	Isfahan	Blood	70 workers of battery industry with occupational exposure to lead 76 office workers of the same factory (control)	36.54 ± 4.34 µg/dl 8.82 ± 3.96 µg/dl	[4]
5	Tehran	Blood	60 soldering workers of an automotive company (experimental group) 60 office workers of the same company (control group)	36.3 ± 9.9 µg/dl 13.6 ± 6.1 µg/dl	[5]
6	Arak	Blood	67 Emarat lead and zinc mine and workers 67 farmers near Emarat lead and zinc mine	9.64 ± 3.281 µg/dl 5.07 ± 3.061 µg/dl	[6]
7	---	Blood	A 23-year-old worker of a lead battery recycling plant	130.53 µg/dl	[7]
8	Mashhad	Blood	105 workers of a battery manufacturing factory	32.2 ± 13.7 µg/dl	[8]
9	Zanjan	Blood	40 workers of zinc smelting factory 40 healthy men in the same area (control)	16.06 µg/dl 10.47 µg/dl	[9]
10	Yazd	Blood	490 workers of Koushk lead and zinc mine	48.98 ± 23.25 µg/dl	[10]
11	Tehran	Blood	32 welding workers in automotive industry	62 µg/dl	[11]
12	Yazd	Blood	70 workers of Koushk lead mine 70 workers of Yazd Baf textile factory	7.06 ± 4.84 µg/dl 4.97 ± 1.70 µg/dl	[12]
13	Tehran	Blood	11 welding workers in an automotive factory (control) 8 welding workers in an automotive factory (experimental)	62.6 ± 13.4 µg/dl 67.2 ± 12.8 µg/dl	[13]
14	Mashhad	Blood	108 workers of Mashhad traditional tile factories (2004) 108 workers of Mashhad traditional tile factories (2005)	52.05 ± 32.32 µg/dl 36.15 ± 17.69 µg/dl	[14]
15	Tehran	Blood	31 non-smoking workers	34.8 ± 12.9 µg/dl	[15]
16	Tehran	Blood	50 battery manufacturing workers	96.7 ± 27.9 µg/dl	[16]
17	Yazd	Blood	66 workers in different jobs (all individuals) 21 battery repairmen 12 smoothers and painters 12 radiator and exhaust welders 15 workers directly involved with printing 6 workers indirectly involved with printing	45.51 ± 1.71 µg/dl 46.77 ± 2.14 µg/dl 47.84 ± 2.64 µg/dl 59.42 ± 3.87 µg/dl 36.14 ± 2.76 µg/dl 32.17 ± 6.84 µg/dl	[17]
18	---	Blood	50 building painters 54 individuals as the control group	27.76 ± 3.31 µg/dl 11.81 ± 4.35 µg/dl	[18]
19	Hamadan	Blood	44 workers in gas stations 44 individuals as the control group	30.05 ± 7.01 µg/dl 17.31 ± 3.46 µg/dl	[19]
20	Zanjan	Hair	25 workers of lead ingot industry 25 office workers of the same industry 25 citizens	131.7 ± 93.4 µg/dl 21.1 ± 13.2 µg/dl 27.9 ± 14.1 µg/dl	[20]
21	Isfahan	Urine	60 workers of gas stations	6.975 ± 1.452 µg/dl	[21]
22	Naeen	Hair	25 workers of Nakhlak lead mine	43.52 ± 27.72 µg/dl	[22]

Table 1 (continued)

#	Study location	Sample environment	Sample Size	Lead level	References
23	Tehran	Blood	26 people living in surrounding villages (control)	38.17 ± 43.3 µg/dl	[23]
			15 workers of battery manufacturing industry (control)	63.3 ± 3.4 µg Hb	
			15 workers of battery manufacturing industry (2 nd group)	57.9 ± 6.2µg Hb	
			15 workers of battery manufacturing industry (3 rd group)	59.6 ± 4.9 µg Hb	
24	Tehran	Blood	15 workers of battery manufacturing industry (4 th group)	50.9 ± 5.7 µg Hb	[24]
			228 traffic policemen in Tehran	29.52 ± 7.78 µg/dl	
25	Tehran	Urine	68 police office employees	21.74 ± 5.63 µg/dl	[25]
			35 municipal workers	64.4 ± 35.4 µg/dl	
26	Tehran	Blood	35 control participants	9.2 ± 3.2 µg/dl	[26]
			40 male patients	100.32 ± 18.42 µg/dl	
27	Tehran	Blood	62 control participants	9.33 ± 18.42 µg/dl	[27]
			49 female patients	27.4 ± 3.10 µg/dl	
28	Tehran	Blood	51 control women	12.6 ± 2.30 µg/dl	[28]
			41 male patients	110.3 ± 37.5 µg/dl	
29	Arak	Blood	1,142 citizens of Arak	13.42 µg/dl	[29]
30	Ravar, Feyz Abad	Blood	30 men living around a lead mine	22 µg/dl	[30]
			30 men elsewhere (control)	17 µg/dl	
31	Babol	Blood	427 infected with lead	110.2 µg/dl	[31]
32	Tehran	Blood	430 healthy individuals (control)	14.08 µg/dl	[32]
			100 guidance male students	11.63 µg/dl	
			100 guidance female students	7.21 µg/dl	

Table 2

Studies related to mean blood lead concentration in Iranian patients with specific diseases.

#	Study location	Environment sample	Sample size	Lead level	References
1	Sari	Blood	75 patients with asthma 65 healthy individuals (control)	4.98 ± 3.11 µg/dl 3.35 ± 1.64 µg/dl	[33]
2	Tehran	Blood	93 hemodialysis patient	9.7 ± 3.7 µg/dl	[34]
3	Ahwaz	Blood	33 dialysis patients 33 control participants	2.714 ± 0.64 µg/dl 1.67 ± 0.68 µg/dl	[35]
4	Sari	Blood plasma	32 esophageal cancer patients 32 control individuals	52 ± 15 µg/dl 56 ± 8 µg/dl	[36]
5	Tehran	Blood	80 patients with blood pressure 80 healthy individuals as the control group	5.1 ± 0.4 µg/dl 2.7 ± 0.3 µg/dl	[37]

Table 3

Studies related to mean blood lead concentration among drug users in Iran.

#	Study location	Environment sample	Sample size	Lead level	References
1	Mashhad	Blood	1 oral addict	196.1 µg/dl	[38]
2	Tehran	Blood	39 addicts 39 control participants	57.04 ± 46.03 µg/dl 16.7 ± 12.51 µg/dl	[39]
3	Tehran	Blood	7 lead-poisoned addicts in Loghman-e-Hakim Hospital	109 ± 37.6 µg/dl	[40]
4	Tehran	Blood	One 27-year-old addict worker One 68-year-old addict worker	154 µg/dl 180 µg/dl	[41]
5	Rafsanjan	Blood	22 addicts 22 control participants	21.9 ± 13.24 µg/dl 8.6 ± 3.5 µg/dl	[42]
6	Yazd	Blood	1 oral addict (a 46-year-old man, copper smelting worker)	90 µg/dl	[43]
7	Kerman	Blood plasma	50 opium addicts 43 non-addicts as control group	329.94 ± 14.76 µg/dl 353.27 ± 114.15 µg/dl	[44]
8	Tehran	Blood	One 25-year-old addict	350 µg/dl	[45]
9	Tehran	Blood	One 52-year-old oral addict	116 µg/dl	[46]
10	Tehran	Blood	One 41-year-old addict	118 µg/dl	[47]
11	Tehran	Blood	61 male addicts living in Tehran 40 female addicts living in Tehran All male and female addicts	13.811 ± 6.543 µg/dl 10.184 ± 5.138 µg/dl 12.375 ± 5.642 µg/dl	[48]
12	Hamadan	Blood	Lead-poisoned patient 1 (man, 43 years old) Lead-poisoned patient 2 (man, 25 years old) Lead-poisoned patient 3 (man, 23 years old)	99 µg/dl 77 µg/dl 104 µg/dl	[49]
13	Tehran	Blood	A 34-year-old addict A 57-year-old addict A 45-year-old addict	95 µg/dl 81 µg/dl 37.5 µg/dl	[50]
14	Tehran	Blood	A 40-year-old addict	Over 200 µg/dl	[51]
15	Tehran	Urine	Chronic lead poisoning in a 45-year-old male addict	244 µg/dl	[52]

workers and ordinary people, 2) patients with specific diseases, 3) addicts, 4) pregnant women and women in labor, and 5) infants and children.

workers, ordinary people, patients with specific diseases, addicts, and pregnant women, women in labor, infants, and children.

Table 4
Studies focused on mean blood lead level among pregnant women, women in labor, and infants in Iran.

#	Study location	Environment sample	Sample size	Lead level	References
1	Tehran	Blood	961 pregnant women with timely deliver 72 pregnant women with premature delivery	4.7 ± 4.9 µg/dl 4.8 ± 4.6 µg/dl	[53]
2	Tehran	Blood	75 women (mother's blood wile delivery) 75 neonates of the same mothers (umbilical cord blood)	2.73 ± 0.94 µg/dl 2.83 ± 1.31 µg/dl	[54]
3	Tehran	Blood	348 singleton pregnant women aging 16-32 (the first 3 months of pregnancy)	3.8 ± 2 µg/dl	[55]
4	Tehran	Blood	232 women in labor (total) 36 women in labor with PROM 269 women in labor with non-PROM	3.8 ± 2 µg/dl 4.61 ± 2.37 µg/dl 3.69 ± 1.85 µg/dl	[56]
5	Zarrin Shahr, Isfahan	Breast milk	27 mothers	4.6 µg/dl	[57]
6	Mashhad	Blood	40 mothers with a neonate weighing below 2500 gr 40 mothers with a neonate weighing over 2500 gr	10.49 ± 26.4 µg/dl 12.46 ± 17.5 µg/dl	[58]
7	Ardabil	Blood	65 mothers with a infants weighing below 2500 gr 65 mothers with a neonate weighing over 2500 gr	Below 1 µg/dl Below 1 µg/dl	[59]
8	Isfahan	Blood	32 mothers with intrauterine growth retard (IUGR) 32 neonates with intrauterine growth retard (IUGR) 34 mothers 34 neonates	12.465 ± 1.91 µg/dl 10.747 ± 1.675 µg/dl 13.562 ± 2.691 µg/dl 11.308 ± 1.908 µg/dl	[60]
9	Tehran-Rasht	Blood	86 mothers in a non-polluted region 86 infants in a non-polluted region 85 mothers in a polluted region 85 infants in a polluted region	7.6 ± 41 µg/dl 5.9 ± 3.2 µg/dl 9.07 ± 8.41 µg/dl 6.6 ± 5.18 µg/dl	[61]
10	Tehran	Blood	31 preeclampsia 465 control participants	5.09 ± 2.01 µg/dl 4.82 ± 2.22 µg/dl	[62]
11	Tehran	Blood	55 pregnant women with high blood pressure 55 pregnant women with normal blood pressure (control)	5.7 ± 2 µg/dl 4.8 ± 1.9 µg/dl	[63]

Table 5
Studies focusing on blood lead concentration among Iranian children.

#	Study location	Environment sample	Sample size	Lead level	References
1	Guilan	Blood plasma	90 ill children 90 healthy children	11.643 µg/dl 4.924 µg/dl	[64]
2	Birjand	Teeth	108 children aging 5-12 years (deciduous teeth)	1.96 ± 1.62 µg/dl	[65]
3	Tehran	Blood	100 children with hyperactivity and attention deficit 100 healthy children	7.2 ± 2.365 µg/dl 7.186 ± 3.186 µg/dl	[66]
4	Mashhad	Blood	32 children aging 3-7 years old	16.381 ± 5.719 µg/dl	[67]
5	Zanjan	Blood	45 children aging 7-11 living around Anguran lead mine 36 children aging 7-11 (control)	36.7 ± 24.67 µg/dl 15.57 ± 13.35 µg/dl	[68]
6	Mashhad	Blood	206 children aging 1-7 years	12.195 ± 3.359 µg/dl	[69]
7	Semnan	Blood	320 primary students aging 6-11 in Semnan's schools	21% below 10 µg/dl 74% between 10 and 20 µg/dl 5% over 20 µg/dl	[70]

Acknowledgements

The authors are grateful to department of environmental health engineering, Applied Biotechnology Research Center, health Research Center, Life Style institute, Baqiyatallah University of Medical Sciences, Tehran (Iran) for their support in this study. This research was conducted without any financial cost.

Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at <https://doi.org/10.1016/j.dib.2018.08.052>.

References

- [1] H.A. Yartireh, A.H. Hashemian, The effect of occupational exposure to lead on blood hemoglobin concentration in workers of kermanshah oil refinery, *Toxicology*. 6 (2013) 766–770.
- [2] M. Ghiasvand, K. Aghakhani, A. Salimi, R. Kumar, Ischemic heart disease risk factors in lead exposed workers: research study, *J. Occup. Med. Toxicol.* 8 (2013) 11.
- [3] L. Taheri, M. Sadeghi, H. Sanei, K. Rabiei, S. Arabzadeh, N. Sarrafzadegan, Effects of occupational exposure to lead on left ventricular echocardiographic variables, *ARYA atherosclerosis* 8 (2012) 130.
- [4] S. Pourabdian, N. Eizadi-Mood, P. Golshiri, F. Amini, The relationship between blood lead level and neuro-psychological and hematological findings in lead-exposed workers of battery industry, *Iranian Journal of Toxicology* Volume. 5 (2011).
- [5] M. Dehghan-Nasiri, F. Golbabaii, A. Koohpaa, A. Rahimi-Forooshani, S. Shahtaheri, Biological and environmental monitoring of lead and exposure in the automobile industry, *Iran Occupational Health* 8 (2012) 1–8.
- [6] A. Malekiran, A. Fani, M. Abdollahi, S. Oryan, V. Babapour, S. Shariatzade, M. Davodi, Blood-urine and cognitive-mental parameters in mine workers exposed to lead and zinc, *Amuj* 13 (2011) 106–113.
- [7] S.M. Mohammadi, Colic Created by the lead, *Journal of Medicine modern* 12 (2010) 751–755.
- [8] M.R. Keramati, M.H. Sadeghian, M. Mahdi, Correlation between iron deficiency and lead intoxication in the workers of a car battery plant, *International Journal of Hematology and Oncology* 27 (2010) 169–174.
- [9] S. Kalantari, A. Khoshi, M. Mohebbi, K. Fooladsaz, Investigation of blood lead levels and its toxicity in workers of zinc melting factory of Dandi, Zanjan, Iran, *ZUMS, Journal.* 17 (2009) 79–86.

- [10] M. Aminipour, A. Barkhordari, M. Ehrampoush, A. Hakimian, Blood lead levels in workers at Kooshk lead and zinc mine, *SSU Journals* 16 (2008) 24–30.
- [11] A. Dorosti, J. Shahrabi, Study Of Blood Lead Levels, Hemoglobin & Plasma Ascorbic Acid In A Car Company Welders, *Salamat-e-Kar-e-Iran* 3 (2006) 43–49.
- [12] M. Tabrizizadeh, F. Boozarjomehri, M. Akhavan Karbasi, F. Maziar, Evaluation of the relationship between blood lead level and prevalence of oral complication in Koushk lead mine workers, Yazd province, *J Dent Tehran Univ Med Sci* 19 (2006) 91–99.
- [13] J. Shahrabi Farahani, A. Dorosti, M. Jalali, H. Sadrzadeh, M. Farvid, Effect of 2-Week Ascorbic Acid Supplementation on Plasma Lead Levels in Workers Occupationally Exposed to Lead, *Journal of Rafsanjan University of Medical Sciences* 5 (2006) 75–84.
- [14] H. Nemati Karimavi, M. Balalimoud, S. Shademanfar, Evaluation of Neuropsychiatric Side Effects of Occupational Lead Poisoning in Workers the Mashhad Traditional Tile Factories, *IRANIAN JOURNAL OF NEUROLOGY*. 5 (2006) 1–9.
- [15] M. Aliasgharpour, H. Hagani, Impact of occupational lead exposure on industrial workers health condition in Tehran-Iran, *Eastern Journal of Medicine* 10 (2005) 20–23.
- [16] H.R. Kermani, A. Niktab, The relationship between blood lead concentration and electroneurographic findings in lead-exposed subjects, *Journal of Qazvin University of Medical Sciences and Health Services [The]* 8 (2005) 27–31.
- [17] S.G.M. Ayatollahi, Investigate the relationship between increased blood lead levels and three-immunoglobulin serum levels in staff exposed to risk of lead poisoning, *Journal of Shahid Sadoughi University of Medical Sciences* 12 (2004) 36–43.
- [18] M. SAEB, H.A.S. NAZIFI, Determination of Blood Lead and Deltaaminoleavulinic Acid Dehydratase Levels in Painter Building Workers, *JOURNAL OF MEDICAL COUNCIL OF I.R.I* 22 (2004) 209–214.
- [19] A. Bahrami, H. Mahjub, M. Assari, A study of the relationship between ambient lead and blood lead among gasoline-station workers, *Iran J. Public Health*. 31 (2002) 92–95.
- [20] N.M.N.S.R. Azimi Pirsaraee, A. Khavanin, H. Asilian, A. Soleimanian, Employment role in industrial of Lead ingots in hair lead levels, *Journal of Zanjan University of Medical Sciences and Health Services* 10 (2002) 29–34.
- [21] S. Mirsattari, Urine lead levels in service station attendants exposed to tetraethyl lead, *J. Res. Med. Sci.* 6 (2001) 46–55.
- [22] N. Izadi, K. Montazeri, Hair Lead concentration in Nakhlak Lead miners versus control group, *J. Res. Med. Sci.* 7 (2002) 23–31.
- [23] M. Ghazi-Khansari, A. Hajjighasemkhan, S. Ghazaie, Influences of Thiamine and/or Ascorbic Acid on Lead Intoxication, *Acta Med Iran* 34 (1996) 61–64.
- [24] H. Farsam, G. Salari, A. Nadim, Absorption of lead in Tehran traffic policemen, *Am. Ind. Hyg. Assoc. J.* 43 (1982) 373–376.
- [25] A. Meshkinian, H. Asilian, S. Nazmara, J. Shahtaheri, Determination of lead in the environment and in the urban service workers in a Tehran municipality district, *Journal of School of Public Health and Institute of Public Health Research* 1 (2003) 31–40.
- [26] K. Sadeghniaat-Haghighi, M. Saraie, M. Ghasemi, N. Izadi, F. Chavoshi, A. Khajehmehrizi, Assessment of peripheral neuropathy in male hospitalized patients with lead toxicity in Iran, *Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences* 18 (2013) 6.
- [27] F. Sadeghi, M. Oveisi, N. Sadeghi, B. Jannat, S. Rezayat, M. Behzad, Evaluation of plasma lead concentration in osteoporotic patients by anodic stripping voltametry, *Res. Pharm. Sci.* 7 (2012) 143–155.
- [28] M. Arefi, F. Taghadosinejad, K. Sadeghniaat-Haghighi, P. Salamati, F. Godarz, E. Saadiyani, Effectiveness of Ethylene Diamine Tetra Acetic Acid Treatment in Patients with Lead Poisoning Referred to Baharloo Hospital, Tehran, *Journal of Isfahan Medical School* 29 (2011) 17–31.
- [29] S. Moayyedi, A. Mehbod, A. Fanei, H. Mohajerani, The relationship between blood lead levels and clinical syndromes, *Research in Medicine* 32 (2008) 75–79.
- [30] M. Abbasnegad, A. Abbasnegad, A. Afarinesh, Changes in Blood Pressure and ECG Indices in Males Living Around Ravar, Feyz-Abad Lead Mine, *Journal of Rafsanjan University of Medical Sciences* 5 (2006) 37–44.
- [31] D. Qujeq, E. Baghaie, Evaluation of erythrocyte Protoporphyrin for Lead poisoning detection, *KAUMS Journal (FEYZ)* 4 (2001) 48–53.
- [32] T. Zaman, H. Zadeh, Lead poisoning in an highly polluted district of Tehran in high school children, *Iranian Journal of Pediatrics* 9 (1999) 207–212.
- [33] J. Ghaffari, H. Rafatpanah, Z. Nazari, A. Abaskhanian, Serum level of trace elements (zinc, lead, and copper), albumin and immunoglobulins in asthmatic children, *Zahedan, J Res Med Sci* 15 (2013) 27–30.
- [34] R. Pouresmaeil, E. Razeghi, F. Ahmadi, Correlation of serum lead levels with inflammation, nutritional status, and clinical complications in hemodialysis patients, *Ren. Fail.* 34 (2012) 1114–1117.
- [35] M.T. Jalali, A. Absalan, F. Mastipour, H. Shahbazian, G.A. Kaydani, A. Nasimian, A. Mohseni, The effect of dialysis on the Zinc, Copper, Selenium Aluminium and Lead blood levels in dialysis patients in Ahwaz during 2011–2012, *KAUMS Journal (FEYZ)* 16 (2013) 589–590.
- [36] E. Salehifar, G. Khorasani, M. Shokrzade, M. Asadi, B. Shabankhani², S. Rezaeinejad³, Comparison of plasma levels of zinc and lead in esophageal cancer patients with normal, *Trace Elem. Electrolytes*. 25 (2008) 165–168.
- [37] R. Dizaji, A. Bakhtiarian, K.M. Ghazi, A. Mohaghegh, K.F. Emami, The relationship between the blood lead level and blood pressure, *Journal of Zanjan University of Medical Sciences and Health Services* 11 (2003) 31–37.
- [38] B. Dadpour, O. Mehrpour, L. Etemad, M. Moshiri, Lead poisoning-induced hypertensive crisis managed by prazosin: a case report, *Iranian Red Crescent Medical Journal* 15 (2013) 526.
- [39] M. Amiri, R. Amini, A comparison of blood-lead level (BLL) in opium-dependant addicts with healthy control group using the graphite furnace/atomic absorption spectroscopy (GF-AAS) followed by chemometric analysis, *Iranian Red Crescent Medical Journal* 14 (2012) 488.
- [40] K. Soltaninejad, A. Flückiger, S. Shadnia, Opium addiction and lead poisoning, *J. Subst. Use*. 16 (2011) 208–212.
- [41] R. Moharari, M. Khajavi, M. Panahkhahi, M. Mojtahedzadeh, A. Najafi, Loss of consciousness secondary to lead poisoning—case reports, *Middle East J. Anaesthesiol.* 20 (2009) 453–455.

- [42] H. Salehi, A. Sayadi, R. Zare, N. Soltanpour, A. Hoseinpor, Comparison of Serum Lead Level in Oral Opium Dependent Men with Healthy Control Group, *medical journal of mashhad university of medical sciences* 52 (2009) 129–132.
- [43] H. Salman-Roghani, A. Foroozan, Lead poisoning, report of an interesting case, *Govareh* 14 (2011) 39–46.
- [44] M.M.H. Abbasi, M. Ansari, A. Shahesmaeili, A. Qaraie, Lead serum levels in opium-dependent individuals, *Addiction & health* 1 (2009) 106.
- [45] F.J. SR Fatemi, E. Maserrat, M.R. Zali, Poisoning Reports of Very Severe-Lead in Addict of Inhaled and Oral, *J. Med. Council Islam. Repub. Iran.* 27 (2009) 117–120.
- [46] H. Nazari, Lead Poisoning in Oral Substance Abusers, *J. Addict. Med.* 9 (2009) 91–99.
- [47] S. Mohammadi, A. Mehrparvar, M. Aghilinejad, Appendectomy due to lead poisoning: a case-report, *J. Occup. Med. Toxicol.* 3 (2008) 23.
- [48] L. Farzin, M. Amiri, H. Shams, M.A.A. Faghih, M.E. Moassesi, Blood levels of lead, cadmium, and mercury in residents of Tehran, *Biol. Trace Elem. Res.* 123 (2008) 14–26.
- [49] R. Shiri, M. Ansari, M. Ranta, K. Falah-Hassani, Lead poisoning and recurrent abdominal pain, *Ind. Health.* 45 (2007) 494–496.
- [50] M. Masoodi, M.R. Zali, M.-J. Ehsani-Ardakani, A.-H. Mohammad-Alizadeh, K. Aiassofi, R. Aghazadeh, A. Shavakhi, M.-H. Somi, M. Antikchi, S. Yazdani, Abdominal pain due to lead-contaminated opium: a new source of inorganic lead poisoning in Iran, *Arch. Iran. Med.* 9 (2006) 72–75.
- [51] M. Baigmohammadi, M. Mohammadi, A. Mahmoodpour, K. Karvandian, M. Aghdashi, Quadriplegia due to lead-contaminated opium&58; a case report, *Tehran University Medical Journal* 66 (2008) 521–524.
- [52] S.S.M.A. Nikkho, M. tabibi, Anemia of Chronic Lead poisoning in a person suffering from thalassemia minor, *Tehran University Medical Journal* 31 (1974) 205–208.
- [53] B. Afkhami, M. Lamyian, E. Hajizadeh, The Association between Maternal Blood Lead Levels and Preterm Birth, *Journal of Mazandaran University of Medical Sciences* 22 (2012) 19–24.
- [54] V. Cheraghi Nezhad, L. Banaem Moghadam, Lead, Cadmium, and Selenium Levels in Maternal and Umbilical Cord Blood and their Relationships, *Payesh* 11 (2012) 679–684.
- [55] M. Vige, K. Yokoyama, Z. Seyedaghamiri, A. Shinohara, T. Matsukawa, M. Chiba, M. Yunesian, Blood lead at currently acceptable levels may cause preterm labour, *Occup. Environ. Med.* 68 (2011) 231–234.
- [56] M. Vige, K. Yokoyama, A. Shinohara, M. Afshinrokh, M. Yunesian, Early pregnancy blood lead levels and the risk of premature rupture of the membranes, *Reprod. Toxicol.* 30 (2010) 477–480.
- [57] E. Norouzi, N. Bahramifar, S.M. Ghasempouri, Determination Concentration of Lead in Breast in Lactating Women in Region Industrial Zarinshahr and Effect on Infant, *Journal of Isfahan Medical School* 28 (2010).
- [58] M. Mansoori, A. Shah Farhat, A. Mohammadzadeh, The evaluation of the effect of maternal blood lead concentration on the incidence of delivery of low birth weight neonates, *Scientific Journal of Kurdistan University of Medical Sciences* 14 (2009) 41–46.
- [59] H.S.M. Mirza Rahimi, S. Shahizadeh, Investigate the relationship serum levels of zinc, copper, lead, mother with infant birth weight, *Ardabil University of Medical Sciences and Health Services* 12 (2009) 112–121.
- [60] R. Iranpour, A.A. Besharati, F. Nasser, M. Hashemipour, M. Balali-Mood, R. Kelishadi, Comparison of blood lead levels of mothers and cord blood in intrauterine growth retarded neonates and normal term neonates, *Saudi Med. J.* 28 (2007) 877–880.
- [61] T. Golmohammadi, M. Ansari, A. Nikzamir, A.R. SAFARI, S. Elahi, The effect of maternal and fetal lead concentration on birth weight: polluted versus non-polluted areas of Iran, (2007).
- [62] M. Vige, K. Yokoyama, F. Ramezanzadeh, M. Dahaghin, T. Sakai, Y. Morita, F. Kitamura, H. Sato, Y. Kobayashi, Lead and other trace metals in preeclampsia: a case–control study in Tehran, Iran, *Environ Res.* 100 (2006) 268–275.
- [63] M. Vige, K. Yokoyama, M. Mazaheri, S. Beheshti, S. Ghazizadeh, T. Sakai, Y. Morita, F. Kitamura, S. Araki, Relationship between increased blood lead and pregnancy hypertension in women without occupational lead exposure in Tehran, Iran, *Archives of Environmental Health: An International Journal* 59 (2004) 70–75.
- [64] S. Maleknejad, A. Heidarzadeh, M. Rahbar, A. Safaei, B. Ghomashpasand, Evaluation of serum lead levels in children with constipation and normal controls in northern Iran, *Iranian journal of pediatrics* 23 (2013) 417.
- [65] K. Pashmi, A. Pourkhabbaz, Accumulation of toxic metals of cadmium and lead in the deciduous teeth of children, *Journal of Birjand University of Medical Sciences* 19 (2012) 42–51.
- [66] s Daroogar, r Davari, L.A. Kamran, The association of attention deficit hyperactivity disorder and blood lead level among children less than 10 years old referred to Tehran hospitals between 2007 and 2010, *Medical Sciences Journal of Islamic Azad University.* 22 (2012) 57–61.
- [67] K. Deldar, E. Nazemi, M.B. Mood, S.A. Emami, A.H. MohammadPour, M. Tafaghodi, R. Afshari, Effect of *Coriandrum sativum* L. extract on lead excretion in 3-7 year old children, *Journal of Birjand University of Medical Sciences* 15 (2008) 12–24.
- [68] M. Mahram, N. Mousavinasab, H. Dinmohammadi, S. Soroush, F. Sarkhosh, Effect of living in lead mining area on growth, *The Indian Journal of Pediatrics* 74 (2007) 555–559.
- [69] A. Farhat, S. Parizadeh, M. Balali, G.R. Khademi, The Serum Lead Level of Children in Emergency Ward, *Medical Journal of Mashhad University of Medical Sciences* 48 (2006) 405–408.
- [70] M. Faranoush, M. Malek, R. Ghorbani, M. Rahbar, Z. Safaei, Study of the blood lead levels and related factors in the 6-11 years old children in Semnan, *koomesh* 4 (2003) 79–86.