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STUDY OF WATER POLLUTION PROBLEM IN BASRA CITY OF IRAQ: A CASE STUDY

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Abstract

Pollution is one the most big and dangerous problems faced by human on the earth, because water considered the source of life, water pollution effects on human, animals and plants. water pollution occurred recently in Basra city -560 km south of Baghdad – that lead to death of many plants and animals like fish in high quantities, most peoples live in Basra suffered from fever, diarrhea, problems in kidney, and respiratory system.In this study many different samples of water was examined and showed increasing of heavy metals concentration -like Cr, Pb, Fe and Zn-, also blood samples was taken from patients of hospitals, and data refereed to increasing of urea, cholesterol, and WBC counts while decreasing in RBCs numbers when compared with normal control. According to the results of present study, many sources of pollution in water of Basra include solid pollutants, chemicals, and bacteria.

Key words : Water pollution, blood samples, heavy metal concentration.

Introduction

Water is very important to life. No of water on earth mean no exist of life(Al-Saady, 2006). Environmental Pollution is refer to an exchange in the energy, material in water, soil, and air leading to acute or chronic limits ecological quality and balance the of life (Davis *et al*., 2008; Enger, 2018). Pollutants can cause primary effects, with direct clear impact on the ecosystem, or secondary effects in the balance of the natural or biological food that may distinguished for long times (Jawadekar, 2009; NIOSH 2003).

The activity of industry, increasing of motorized vehicles, and the highly increasing of the human population, lead to exponential growing in the presence of goods and services. These increasing and growth results increasing in wastes by products (ACSH, 2000). The polluted industrial waste and domestic water, produce excess of chemicals leading to a many big ecological problems on earth. Pollution actually happened because of energy conversions by using of resources that leaves their polluted by- product in water streams (Xing, 2004).

Water pollution happens when toxic substances enter water. This decrease the quality of water. Water pollution can be caused indirectly sources like by microorganisms and via rain (Greenwood *et al.,* 1984).

Basra is the most southern governorate of Iraq, and is Iraq's third largest urban center – 542 km south of Baghdad, 4,700,000 peoples in 2019 , the Shatt Al-Arab water stream formed by the meeting of the Tigris and Euphrates rivers and empties into the Persian Gulf, also many small lakes and marshland stretches can be found. Basra has a very hot and arid climate. Because the summer temperatures in Basra are the highest in the world. Because of the effects of the Arab Gulf, humidity and rainfall are however also high. Basra obtains about 152mm of rainfall in a year between October and May months. Basra is subdivided into seven cities : Abu Al-Khaseeb, Al-Midaina, Al-Qurna, Al- Zubair, Basrah, Fao, and Shatt Al-Arab. Capital (MIC, 2017).

Before four decades , Iraqi governments not able to manage and regulate resources of water, especially in Basra, because about four millions people depending on the Shatt al-Arab river as a safe drinking freshwater not only for human but also for animals and plant. Iraqi failures

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since 1980s, like simple manage of upstream sources, bad treatment of pollution and sewage materials, and long neglect of water stream, that lead to cause low quality of water purity.

The degradation of water of Basra sources become a big problem and more dangerous in the summer of 2018, more than 100,000 people were hospitalized with symptoms related to water quality include rashes, abdominal pain, vomiting, and diarrhea. In August, Basra Health Directorate identified contamination of water, and suggest people to boil all water before using, This problem was similar to many events of pollution in many other countries in the world (Ramzan *et al.,* 2011).

Materials and Methods

The study was carried out from Basra city , 50 un related human with age ranging 10-50 year, Group A. While Group B represent 50 healthy individuals of different ages ranged from 10-50 years from Baghdad city (Control group). The work of this study was performed in educational laboratories, City of Medicine, Baghdad, Iraq.

Many supplies of water was taken and kept separately in certain cleaning tubes, from different regions in Basra to measure the concentration of heavy metals, also 10 ml. of blood samples has been taken from each person in both two groups. All blood samples were shipped in a cool box. Then the blood samples analyzed for measuring of heavy metal concentrations with aid of flameless atomic absorption in two groups (Alanee, 2011).

Biomedical tests, in hematology like red blood cells counts and white blood cells counts was performed, while in biochemistry cholesterol and urea tests was done in both groups (Afrid *et al.,* 2013).

Results and Discussion

In water a comparison between the two regions to measuring the concentration of heavy metals as in table

Table 1: Heavy metal concentration in water (microgram/liter).

Heavy Metal	Group A	Group B
Fe	-	-
Pb	0.1351	0.0545
Cu	-	-
Cr	0.917	0.616
Zn	-	-

1 below :

Waters according to this data, in both samples Basra city polluted largely and may be non-safe for human, animals, and plant using, (Pandey *et al.,* 2009) and these data recording an increasing in the concentration of heavy metals in water, especially Pb may be because petroleum activities in Basra according to WHO data for waters (Domingo *et al.,* 2001).

Medically many tests include red blood cells count, white blood cells count, cholesterol, and urea, were performed in both samples to determined health case in studied individuals to determine causes of these symptoms mentioned in the introduction of this study and

Table 2: Medical tests in tow studied samples.

Test	Group A	Group B
R.B.C	4.27+0.96	4.43+1.05
W.B.C	13.65+2.14	9.51+1.71
Cholesterol	6.24+1.42	4.32+0.85
Urea	7.25+1.87	4.16+0.93

that reported by the hospitals in Basra city, as in table 2.

According to the results of this table, Red blood cells value decreased According to these results, RBC. Decreased in the studied sample (4.27+0.96) when compared with control (4.43+1.05), that may indicate gas pollutions effect on blood measurements (Al-Sayd, 2000) while White Blood Cells value were increased in the studied group as compared as with control group, (13.65+2.14, 9.51+1.71) respectively, that indicate an infection case (Arkusz *et al.,* 2005) or due to heart disorder. In Cholesterol values, a slightly increasing in studied sample (6.24+1.42) while (4.32+0.85) in control, this increasing may be due to hard muscle stress for workers. Urea readings also increased in studied sample, (7.25+1.87) when compared with control (4.16+0.93), increasing in urea may due to hard working or low activity of kidneys or may be because of blood deficiency. also due to blood deficiency that come to kidneys (Al-Maliki, 2005; Al-Helaly, 2011).

Finally the present study assumed that water in Basra must be examined and treated by global teams because of complex pollution effects include chemical and microbial pollutants (Al-Lami *et al.,* 2019; Ajmi, 2018).

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