



" ENVIRONMENTAL ASSESSMENT OF WINDBORNE POLLUTANTS FROM KIFL BRICK FACTORIES AND THEIR IMPACT ON HUMAN HEALTH"

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Article history:		Abstract:
Received:	September 4 th 2022	Brick factories are considered environmentally polluted areas due to the products of combustion processes, which in turn have a significant negative impact on the health of workers in those areas or those who live near them. Therefore, this study was designed to investigate those pollutants, especially gaseous ones such as carbon dioxide, carbon monoxide and nitrogen monoxide. The extent of their impact on human health, the concentration of some vital indicators for workers in that area was measured and compared with healthy people far from the pollution area, such as urea, cholesterol and triglycerides. out. As for the vital signs, they were also high in the people in that area compared to the healthy people.
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INTRODUCTION

The tremendous development in various fields related to the needs of the individual and society in the modern era, due to the emergence of many important problems in the field of environmental pollution and the various environmental elements represented With air, water and soil, where scientific progress has been associated with the production of many harmful chemical compounds.

The environment, with the expansion of the use of fuels such as coal, oil and natural gas in all areas of life, various air pollutants have spread in the environment in which we live, such as the gases resulting from them. The combustion of fuels and various industrial activities, which included carbon, nitrogen and sulfur oxides (1).

A person may be patient with hunger and thirst for days, but he cannot be patient with the lack of air or its corruption for more than a few minutes, and this constant need for air makes the choice in front of man does not exist as he must breathe the available air regardless of its quality and degree of pollution. It is one of the main global problems which are of interest to the peoples of the earth and of which mankind is concerned that they suffer greatly from them now and may cause their decline in the future (2).

Lead to corruption of ecosystem properties (3). The recent increased focus on the problem of

pollution may indicate sudden changes in the environment. The areas most affected by air pollution are those surrounding and including factories producing oxides of sulfur, nitrogen, fluoride and dusty particles. Cement factories.

Many studies and research have dealt with this phenomenon and its effects on human health (4). In our country, Iraq, a large segment of workers in factories, especially workers in them, bears primitive brick factories and stone oven workers (bakeries) great risks represented in the use of these factories for black oil or Even the motor oils used in brick factories or the white oil in some ovens and bakeries.

The risks of inhaling the gases emitted from the combustion of black oil, used oils and white oil are inhaled by workers, including carbon monoxide (CO) and dioxide Carbon (CO₂), sulfur oxides (SOX), nitrogen oxides (NOX), and other fumes have also been shown in Study (5) exposure to carbon monoxide to cause cardiovascular disease.

Therefore, this study was applied to workers in brick factories located in the city of Al-Kifl, which is :It is located south of babil city. In order to educate the community and draw the attention of those responsible for these dangers and the need to replace them with advanced ovens that adopt modern methods as in automatic ovens, taking into account the use of health protection methods such as filters or wearing special masks.



MATERIAL AND METHOD

The kits used in the study's measurements

Name of kit	Company
Urea	Bio System
Cholesterol	Chemicals linear
Triglyceride	Bio System

This study done during 2022. In this study, 5 locations were selected from the area of the Kifl brick plants, and the changes in the gases emitted from those plants were measured over 4 seasons during the year: summer, autumn, winter, spring.

The concentrations of the following polluting gases, CO₂, CO, NO_x were measured. These gases are obtained by means of a gas detector, a type of Drager CMS. During this study, 30 blood samples were also collected from donors working in those areas to measure some vital indicators such as cholesterol, triglycerides and urea.

Blood was taken from volunteers working in brick factories after going to their workplace and after identifying their health status through A form that contained questions asked to them when taking the sample.

These questions included age, length of work period in brick laboratories, whether this period is continuous or intermittent, and whether people suffer from any diseases that may affect the results of the examinations.

It was put into plastic tubes of the same size Cover tightly and free of anticoagulant and then put it in the centrifuge for ten Minutes and at a speed of 3000 revolutions / minute, the serum free of red blood cells was withdrawn by Using a micropipette, it was placed in sterile, clean tubes and kept at room

temperature -20 Until it is used in chemical tests as is customary.

The level of cholesterol was determined by the Enzymatic Method, using a diagnostic kit equipped by Linear Chemicals, which is manufactured in Spain. The kit consists of the kit and the first package contains a solution of three buffers, the second package contains the enzyme, and the third package contains the standard solution, which must be kept at a temperature of 2-8 °C.

In order to maintain its chemical properties and effectiveness. The level of triglycerides in the blood serum was determined by using the enzymatic method, using a diagnostic kit supplied by Bio System (Spain).

The kit consists of three packages. The first package contains Buffer's buffer solution It contains, The second package is the enzyme, and the third package contains the standard solution, which must be Store at a temperature of 2-8 °C.

In order to maintain its chemical properties and effectiveness. Serum urea was determined by enzymatic method using kit. It is supplied by Bio Systems and according to the method established by it. Factory in Spain. The kit consists of four packages, the first containing the buffer solution and the second bottle. sodium hypochlorite, the third package the enzyme, and the fourth package the measuring solution.

RESULTS

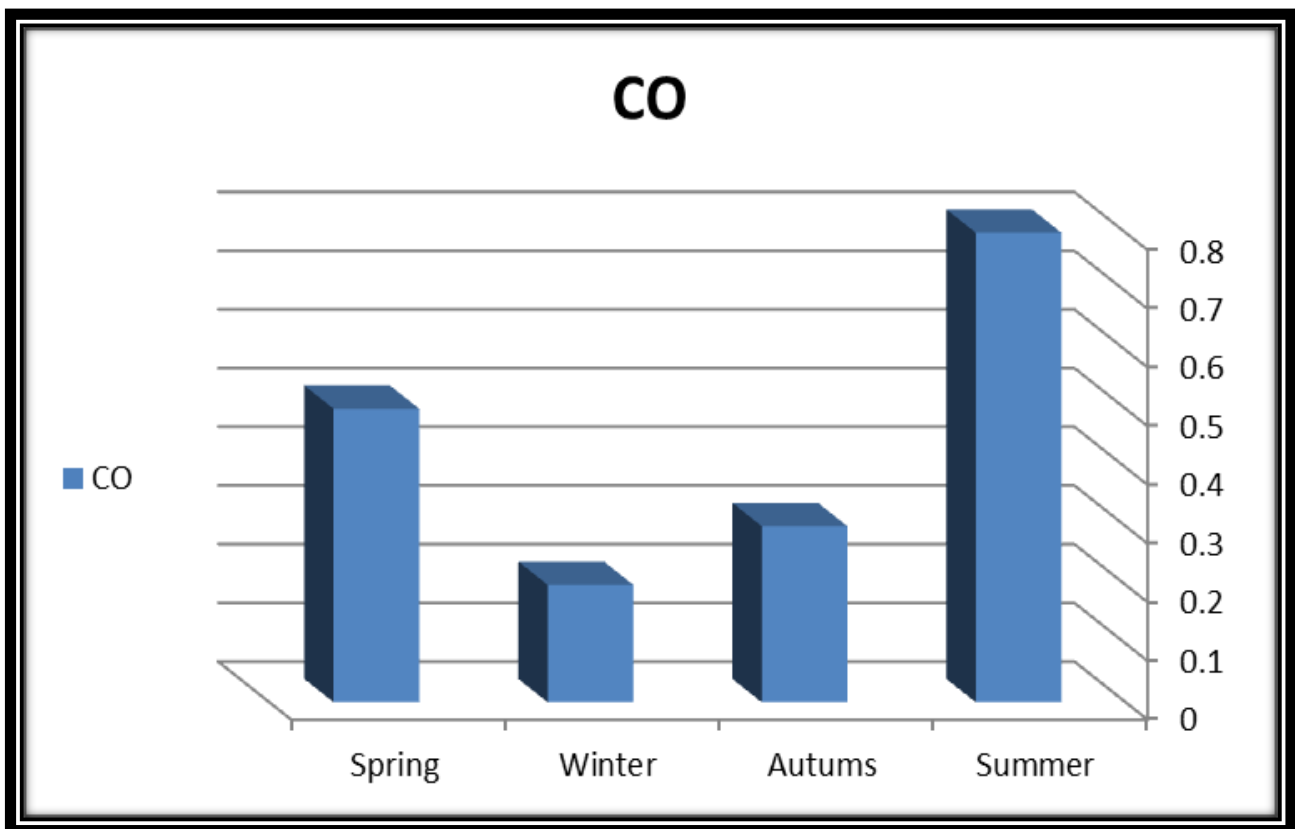
Table (1) Average concentration of polluting gases for five sites during four seasons

Season	Summer	Autums	Winter	Spring	Limited environment
Mean of 5 sites					

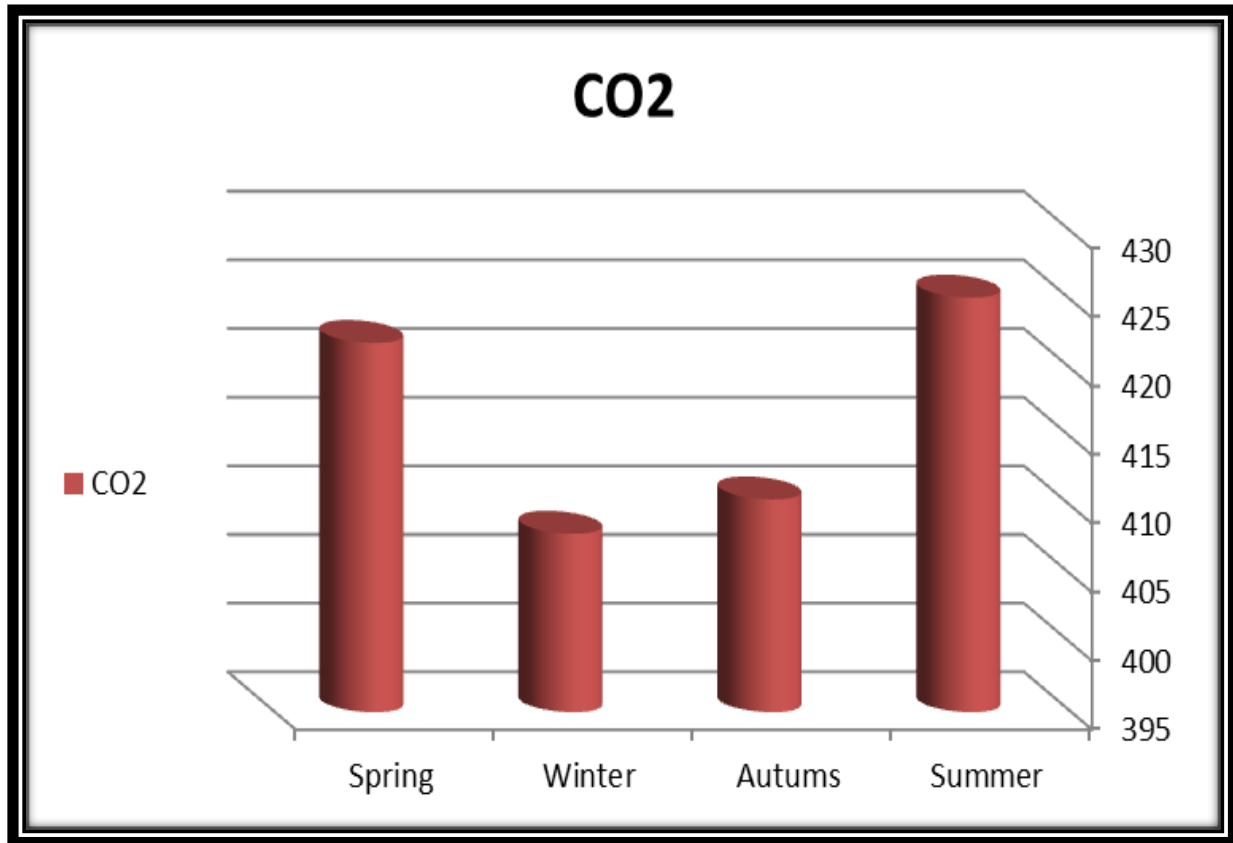


CO	0.8	0.3	0.2	0.5	0.1
CO₂	425.2	410.5	408	421.9	250
NO_x	0.3	0.2	0.1	0.25	0.01

Shape (1) average concentration of carbon monoxide (CO₂) for five sites during four seasons



Shape (2) average concentration of carbon dioxide for five sites during four seasons



Shape (3) average concentration of nitrogen oxides for five sites during four seasons

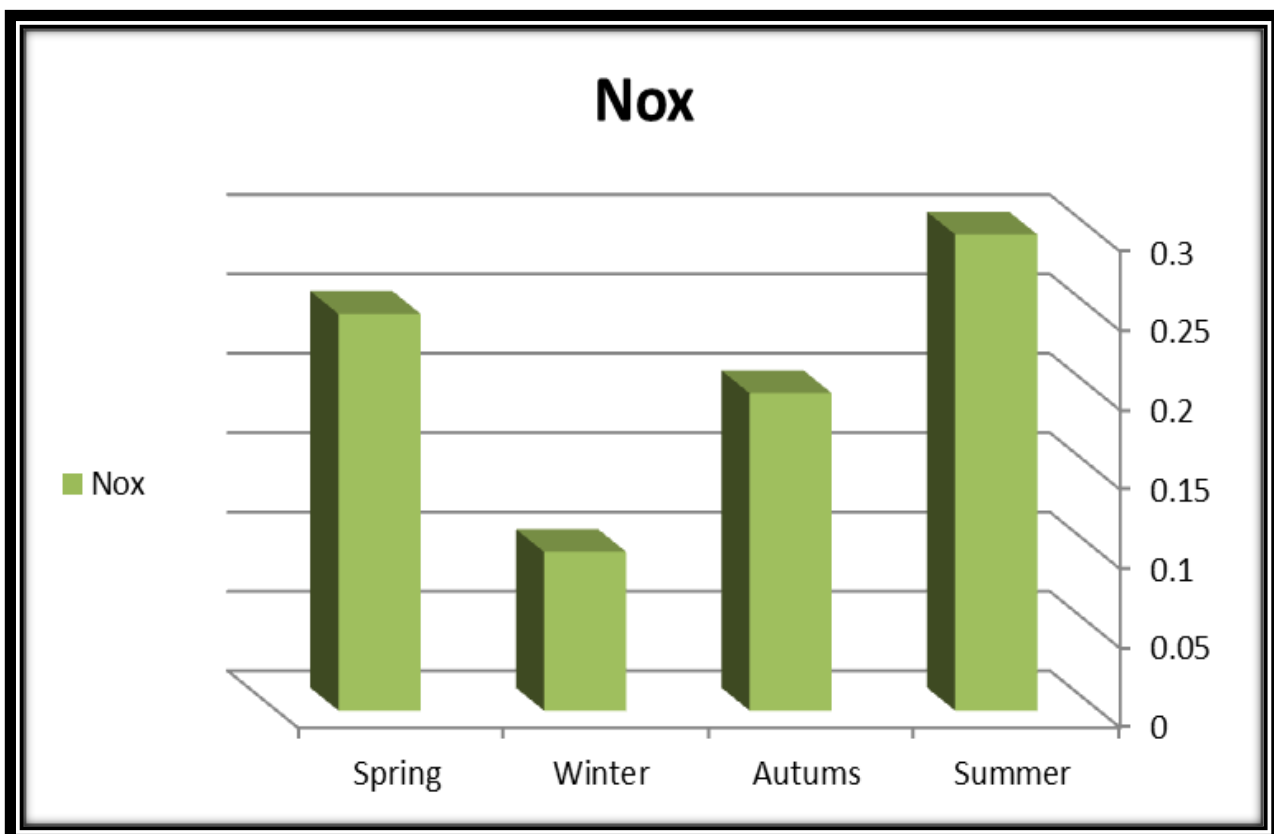




Table (2) Statistical results of measuring serum urea rate for the control group and volunteers

SE	SD	Mean mmol/L	Groups
0.221	1.92	3.39	Volunteers
0.085	0.74	3.36	Control

Shape (4) serum urea rate mmol/L for the control group and volunteers

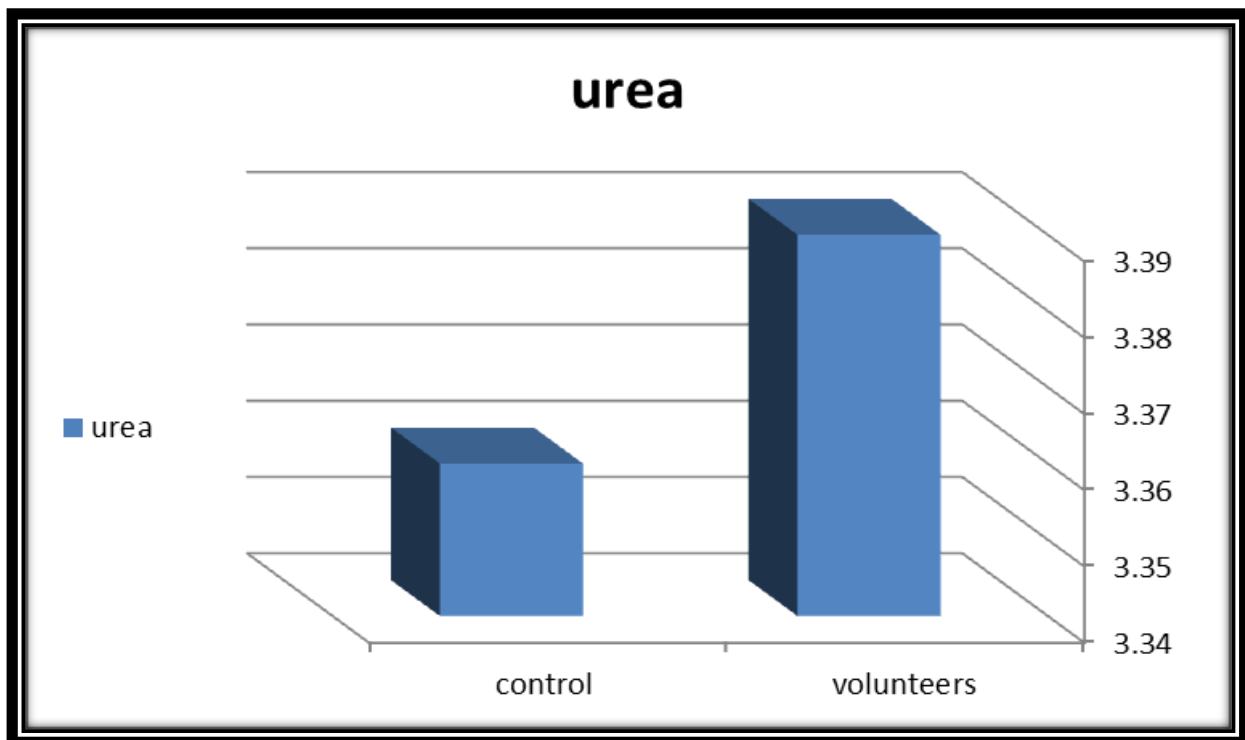


Table (3) Statistical results of measuring serum triglycerides for the control group and volunteers.

SE	SD	Mean mmol/L	Groups
0.299	1.63	2.32	Volunteers
0.122	0.53	1.32	Control

Shape (5) serum triglycerides mmol/L for the control group and volunteers.

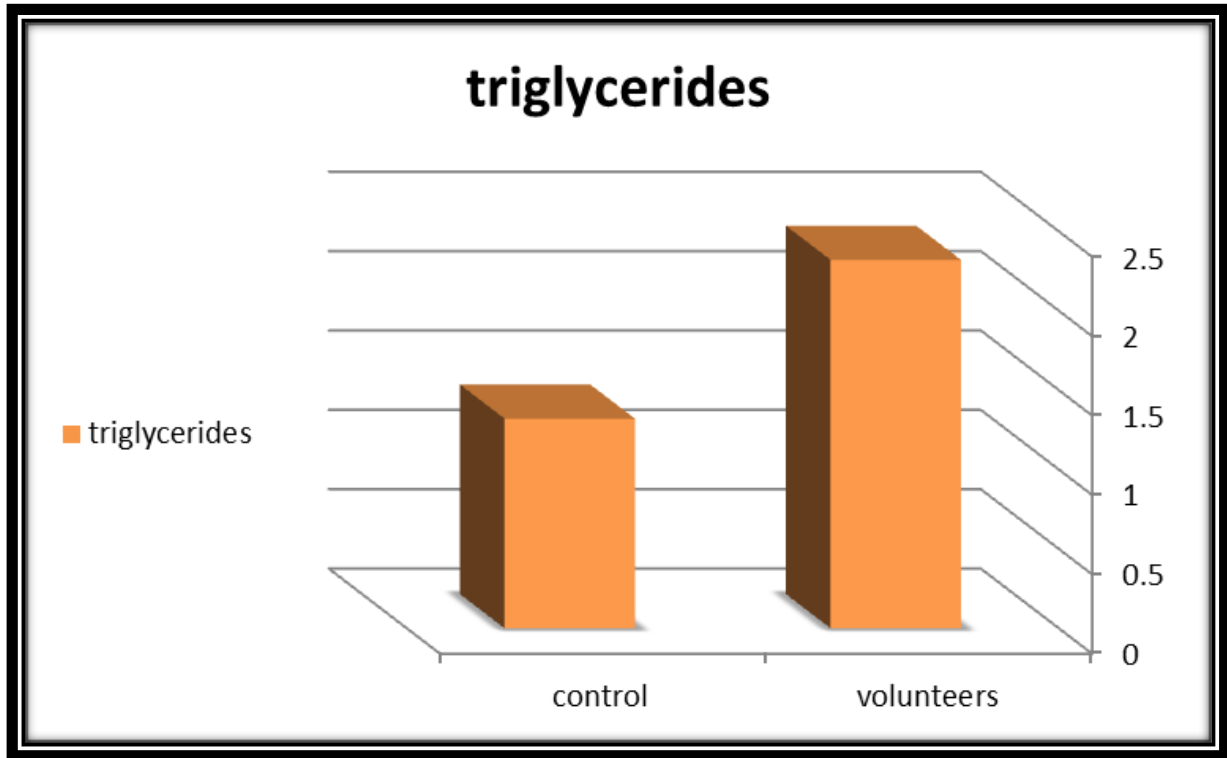
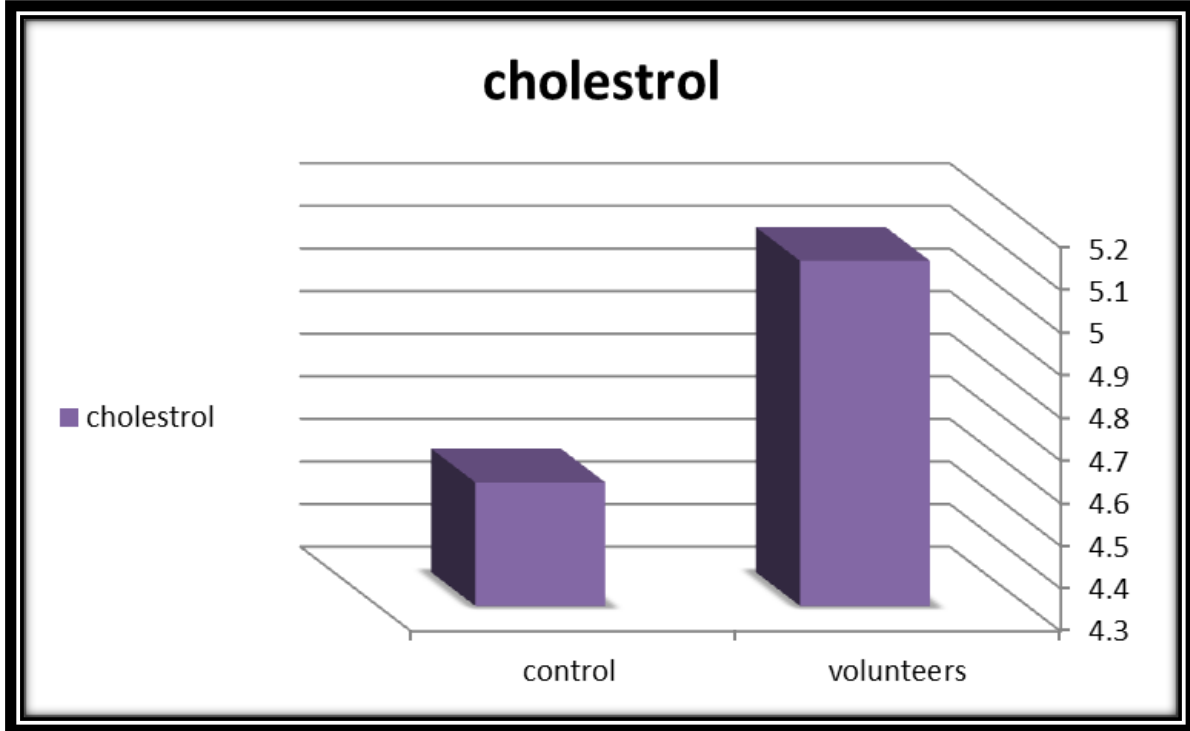


Table (4) Statistical results of measuring serum cholesterol for the control group and volunteers.

SE	SD	Mean mmol/L	Groups
0.285	1.26	5.11	Volunteers
0.208	1.13	4.59	Control

Shape (6) serum cholesterol mmol/L for the control group and volunteers.



DISCUSSION

It is evident from the field measurements of the gases polluting the environment in Table (1) that the carbon dioxide gas concentration in summer, autumn, winter and spring (425.2, 410.5, 408 and 421.9) ppm respectively, during the summer in the area directly under the pollutants of the factories, which recorded the highest concentration of gas, exceeding the permissible environmental limits.

In the winter, its concentration (408) ppm, represented by. When observing the above table, it becomes clear that all the studied sites have exceeded the permissible environmental limit of (250) ppm before the industrial revolution for the summer and winter seasons (6).

The concentration of carbon monoxide gas during the summer (0.8) ppm, while in the winter, its concentration was between (0.2), while the rest of the autumn and spring seasons were (0.3 and 0.5) ppm respectively and when compared with the qualitative specifications of the quality of The air quality is evident that it exceeded the permissible limit during the two studied seasons, as it is located in the direction of the wind, and therefore the wind speed and direction have a role in the transfer of pollutants to the area located its effect (7).

The concentration of nitrogen oxides during summer, autumn, winter and spring (0.3, 0.2, 0.1 and

0.25) ppm was the highest, respectively, where all the values indicated that they were above the internationally permissible limits, and the reason is that the region is under the influence of winds. That rise in the gases values indicates the presence of pollution in leaving the area, which in turn may negatively affect the lives of workers in that area. Therefore, some vital indicators of the human body have been measured in the sera extracted from the blood of donor workers in that region (7).

By presenting and analyzing the results of the urea test as show in the table (2), we note that there are significant differences, as this percentage is It increases in volunteers from the workers compared to the control group, and this is explained by the occurrence of stress on the kidneys as a result of sweating and the heat of the air.

Because of the short period of blood feeding to the kidneys, where The proportion of blood reaching the kidneys reaches 22% of the volume of cardiac output, while this decreases The amount is reduced to 1% during effort and energy expenditure conditions due to a large proportion of blood going to Muscles (8) On the other hand, the heavy sweating that the worker is exposed to in the atmosphere of the brick factories leads to the loss of a quantity of fluids and with it some metabolic waste, and this is all due to the high stress that occurs to the kidneys (8).



According to Goldstein, the level of urea in the blood increases when the kidneys are malfunctioning (9). By presenting and analyzing the cholesterol test results, we find that the cholesterol ratio in the two groups, the volunteers from the workers and the control group, is within the normal limit and there are no significant differences despite the presence of a slight, ineffective decrease for the volunteers from the workers.

It is believed that the reason for this decrease is the effort that the body is exposed to, as These conditions are accompanied by a decrease in the effect of cholesterol on its effect, in addition to fatty acids by metabolizing carbohydrates (10), meaning that the fatty acids provide the body with its energy needs, which leads to a decrease in the level of cholesterol (11) The muscular effort leads to a decrease in the level of cholesterol due to increased oxidation in the body and this The percentage is affected by the type of fat consumed and the amount of it, as saturated fat increases blood cholesterol.

By presenting and analyzing the results of the triglyceride examination test, it was found that there are significant differences, as we note an increase in the value of the volunteer workers compared to the control group. fatty acids, and since an increase in insulin causes a drop in the level of sugar as we have in our study, this explains the presence of an increase in triglycerides (9).

By presenting and analyzing the results of the triglyceride examination test, it was found that there are significant differences, as we note an increase in the value of the volunteer workers compared to the control group.

Fatty acids, and since the increase in insulin causes a drop in the level of sugar as we have in our study, this explains the presence of a rise in triglycerides, Our results were in agreement with both (12) and that the gaseous pollutants that workers are exposed to in brick factories lead to a rise in Triglyceride levels and a decrease in cholesterol levels.

Muscular stress, tension and energy expenditure stimulate the fat-digesting hormone lipase, which acts as glycerol fatty acids to the body, tissues in the body, fat digestion on cortisol (13), the increase of these fatty acids and cortisol leads to increased stimulation of the liver to secrete insulin, which increases the synthesis of glycerol Triglycerides and lipoproteins (14) These joint effects on the liver of insulin secretion and an increase in the synthesis of triglycerides and lipoproteins lead to the transformation of lipoproteins into receptors for cholesterol present in the blood

serum, which binds to cholesterol and reduces its amount in the blood serum (15).

This is in agreement with our results of an examination Cholesterol and triglycerides, which showed a low level of cholesterol and an increase in the value of triglycerides.

REFERENCES

1. Sterner, M. (2009). Bioenergy and Renewable Power Methane in Integrated 100% Renewable Energy Systems. Limiting Global Warming by Transforming Energy Systems: Limiting Global Warming By Transforming Energy Systems (Vol. 14). kassel university press GmbH.
2. Hashem, Bassem Muhammad, 2009, (measuring and studying the concentrations of some air pollutants in the city of Baghdad). Al-Mustansiriya, Iraq. Master's thesis, atmospheric sciences/university.
3. Pradipta, L. (2017). CORRUPTION IN ACCESSING AND UTILIZING THE COMMON PROPERTY RESOURCES IN INDONESIA. Jurnal Kependudukan Indonesia, 11(1), 63-70.
4. Ovie Kori-Siakpere and EO, Ubogu, 2008, (Sublethal haematological effects of zinc on the freshwater fish, *Heteroclaris* sp.), African Journal of Biotechnology . Vol 7, No 12.
5. Roberto M & Leo E.2010, The therapeutic potential of carbon monoxide, Discovery J.9:728-743.
6. Hashim, B. M. (2016). Evaluation the Effects of Industrial CO₂ Emission on Climate Changes in Iraq (Doctoral dissertation, Atmospheric Sciences Dept., College of Sciences, Al-Mustansiriya University).
7. Al-Kasser, M. K. (2021, June). Air Pollution in Iraq Sources and Effects. In IOP Conference Series: Earth and Environmental Science (Vol. 790, No. 1, p. 012014). IOP Publishing.
8. McArdle W.D, Katch, V.L, 2000(Essentials of Exercise Physiology, Lippincott Williams & Wilkins), U.S.A .P(75-76).
9. Moureu, H., 'Carbon monoxide as a test for air pollution in Paris due to motor-vehicle traffic', Proc. Roy. Soc. Med., 57, 1015-20, 1964.
10. Clay, F, Semenkovich, Jay, W, Heineke, J, W, 1997. Diabetes.46:323-327.
11. Chuang, Kai-Jen; Yan, Yuan-Hong MD; Cheng, Tsun-Jen MD, 2010, (Effect of Air Pollution on Blood Pressure, Blood Lipid and Blood Sugar: A Population-Based Approach),



Journal of Occupational & Environmental
Medicine:- 52 3 - 258-262.

12. Roberto M & Leo E.2010, The therapeutic potential of carbon monoxide, *Discovery J.*9:728-743.
13. Mafauzy M.,Mohammed B.,Anum Y.Zulkifli A.(1990). A study of fasting diabetic patients during the month of Ramadan*MedJ.malaya.*, 45:14-17.
14. Salter AM, Fisher SC and Brindley DN. 1987(Binding of low- density lipoprotein to monolayer cultures of rat hepatocytes is increased by insulin and decreased by dexamethasone). *FEBS Lett.*,; 220: 159-162.
15. Mulvihill, E. E., Allister, E. M., Sutherland, B. G., Telford, D. E., Sawyez, C. G., Edwards, J. Y., ... & Huff, M. W. (2009). Naringenin prevents dyslipidemia, apolipoprotein B overproduction, and hyperinsulinemia in LDL receptor–null mice with diet-induced insulin resistance. *Diabetes*, 58(10), 2198-2210.