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EXPOSURE TO GAS AND CHEMICALS (FREON GAS) AND METHODS OF FIRST AID: A REVIEW ARTICLE

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ABSTRACT

Humans are considered one of the most important components of the environment, which Freon affects indirectly, by creating a danger to the environment in which they live, which may prevent them from living in the environment as a result of its destruction, in addition to its direct danger through its negative impact on human health, through When a person smells this gas, this leads to serious effects on the functioning of the lungs and leads to a malfunction in the functioning of all body systems. It also has a significant impact on genes, as it has the ability to cause damage to them, and it leads to a weakening of the immune system as a result of harmful rays from Space, which makes humans vulnerable to many diseases, so there is great importance in preventing them and providing first aid methods when they occur.

KEYWORDS: Human health, Gas exposure, Freon gas, First aid.

A review Article Problem: There is unlimited use of Freon gas by humans in many human activities. There has been an extremely high increase in its quantities and its percentage in the upper atmosphere, and the danger of this gas to the ozone layer through the interaction of chlorine atoms disintegrated from it, which has caused the expansion of the ozone layer's

hole. This is in order to avoid its serious and destructive harm to all aspects of earthly life, and to work to dispense with it in order to preserve the environment and protect living organisms.

A review Article Objective: Focusing on Freon gas, its uses and benefits, as well as its dangers that outweigh everything and its harm to humans and other living organisms, as it seriously affects the entire environment due to its effective and severe impact on the ozone layer, and clarifying alternatives to it to protect the environment from its severe dangers.

The method of the article: We must be careful not to use dangerous Freon in order to avoid any health and environmental problems in order to avoid the destruction of the entire world.

INTRODUCTION

The World Health Organization is keen to protect the environment, its purity and purity, and its freedom from everything that pollutes it and disturbs the safety of its elements, such as soil, water and air. In order to provide an optimal life for all living organisms that live on their skin, including humans, animals and plants, one of the pollutants that we will discuss in this article is talking about the refrigerant gas known by the trade name (Freon), which is an organic chemical with a chemical symbol known as (R22) (Kasuya, et al. 2010). It is currently used in home air conditioners, central commercial air conditioners, and in car air conditioners. It is also widely used in food services, such as transportation, processing and storage (Abbrescia, 2013). It has been discovered that this gas has a direct and even significant impact on the environment, specifically on the ozone layer due to it containing the element (chlorine), as included in global environmental protection regulations. Therefore, it is recommended to gradually reduce the use of this gas in air conditioners in preparation for stopping its use in the future permanently, and then begin using it. The alternative gas, symbolized by R407, is considered environmentally friendly and has less impact on the ozone layer compared to R22 because it does not contain chlorine (Kasuya, et al. 2010; Anant, 2012).

The chemical union between three elements: chlorine, carbon, and fluorine, with certain atomic weights, produces chlorofluorocarbons, which are known for short as CFC, and are commercially known as Freon gas. They were discovered to be an alternative to the use of ammonia gas in refrigeration. Freon gas is one of the non-toxic and non-flammable gases. It is a cheap gas, has a low boiling point, a small specific volume, and has no odor. It is also used for cooling and icing in air conditioners, refrigerators, and coolers (Anant, 2012). There are three most common types, which are:

Freon gas R11, Freon gas R12 and Freon gas R22.

The ozone layer, which is located between 10 and 40 km from the surface of the Earth, has a great importance and role in blocking ultraviolet rays one of the components of the solar

spectrum, which causes great harm to the ecosystem and most living organisms in it if these rays were to leak and penetrate through the atmosphere and reach to the surface of the Earth, God Almighty made it a protective shield and veil for living creatures to protect against the danger of harmful radiation coming from the sun(Björn Palm, 2011). They are inert, meaning they do not interact with other substances and are easy to liquefy. However, most of these uses are their work as a cooling medium in closed systems (Calm, 2008). The danger occurs when the components of these gases are released into the atmosphere, where they collide with sunlight and absorb them, which results in an interaction between the chlorine components with ozone molecules, and this interaction results in the contraction or erosion of part of the ozone layer, and then this interaction is repeated, which results in heating of the ball's atmosphere. Earth, causing what is known as the "global warming effect," which increases the concentration of atoms of this gas and then erodes and shrinks the ozone molecules, thus allowing harmful ultraviolet rays to penetrate through the hole that has been defined by the term "ozone hole" as a result of that process (CHARLES and KETTERING, 1947; Abbrescia, 2013). The dangers of Freon gas to the environmental system have been fully proven, as chemicals that contain chlorine in their components contribute to the destruction of much of the ozone layer, and thus to its depletion. Accordingly, the Montreal Convention stipulated stopping the use or manufacture of this gas or any of... Its compounds, and that is why the implementation of the Montreal Convention is considered. gases that deplete this layer in the atmosphere. Perhaps one of the results of following the policies and laws of the Montreal Convention is that all chlorine levels decreased, which led to the return of the ozone layer to its natural levels that prevailed a year ago. 1980 AD (Dylan, et al. 2011). It has recently been observed that the concentration of dichloromethane, which is present in the atmosphere, is what depletes the ozone layer and is increasing very significantly, and it is a substance that the Montreal Convention did not mention (Venkatarathnam and Srinivasa, 2012). If this increase continues - even if it is slight - it will result in a delay in the recovery of the ozone layer, which will be causes the deterioration of the ozone layer in the atmosphere, and the depletion of the ozone layer in turn threatens human and animal life on the surface of the Earth. Because the ozone layer works to absorb very harmful ultraviolet rays, which is considered a catalyst for the development of multiple diseases, including skin cancer, heart disease, irregular heartbeat, and high blood pressure (Imke et al. 2012) Contact of Freon gas with the skin also leads to burns, even if they are simple and superficial, but they may develop in a serious way. Spontaneously after several days of severe burns if treatment is neglected. It is known that Freon gas is important in any electrical device. It is also widely used in refrigerators and air conditioners, which are indispensable for everyone, as it changes the air from warm and hot to cold. This gas is a help in the atmosphere, but it affects the ozone layer and destroys it, so we resort to other alternatives to preserve the environment (NIST, 1991). Freon gas is released on compounds that contain chlorine, fluorine, and carbon, and its

properties do not ignite and do not help ignite. It has no smell or color, but some species do have a smell. It also has the advantage that it remains a gaseous state but can be converted to a liquid upon cooling or pressure. It is heavier than air, which makes it sink to the bottom if it leaks. Freon gas is considered a completely safe gas, as it does not pose any danger from touching the rest of the parts in the electrical device. It is used in many other industries, such as air perfumes and deodorant. It is used to sterilize any tools that need it. It is also characterized by its cheap price and long life (Anant, 2011; Richter, et al. 2011).

There are types of Freon gas and its use. There is a binary type called chlorodifluoromethane, which is used in commercial and residential devices that have a large capacity, such as air conditioning, ice machines, and storage as well. There is another type called tetrafluoroethane, which is only used in cars. There is a type of trichloromonofluoromethane, which is also used in air conditioning devices, but it causes extreme danger because it contains 3 atoms of the element chlorine, which leads to a serious and severe danger to the ozone layer. There is another type, which is considered an alternative to the binary type, because binary is no longer available due to its excessive waste in the ozone layer (Schrodinger, 2010).

The harmful effects of Freon gas on human health:

Freon gas is inhaled in large quantities, this negatively affects the lungs greatly, the heart and nerves, threatens the kidneys and liver, and can even lead to death. There are several symptoms that occur when inhaling Freon gas, including a feeling of drowsiness and a desire to sleep, and the inability to speak normally. With a feeling of dizziness and even the feeling of being unable to move the limbs (Lopata and Govind, 2011; Dylan, 2012).

When consuming Freon gas, Freon gas can be transmitted to people by consuming it through contaminated water. When drinking it, it is transmitted to the body, which in turn leads to symptoms indicating its presence in the body, including the occurrence of problems in the digestive system with severe diarrhea, pain in the abdomen, and the digestive system greatly with feeling, dizziness and inability to move normally, there are several important warnings for people regarding (Björn Palm, 2011). Freon gas, there must be precautions for people who work directly with Freon gas. If exposure to this gas results from the workplace, then we must pay close attention to wearing masks that eliminate this odor and to constantly follow up with the doctor to maintain health withexcessive and direct exposure to it leads to serious diseases, in addition to constant guidance and awareness about the dangers of Freon gas and the diseases it causes to people and the entire environment, and ensuring that children stay away from places where this gas is present(Takimoto, et al. 2007).

The harmful effects of Freon gas on the environment:

The presence of Freon gas is concentrated in the layers of the atmosphere, especially the stratosphere, when this gas exits into the atmosphere, it first hits the ozone layer and poses a great danger to it, leading to its destruction. Freon gas absorbs ultraviolet rays, which are known to have an impact on the entire world. It causes many problems for humans, animals, and plants, in exposure to these rays continues, people develop cancerous skin diseases. It also causes severe eye damage that leads to loss of vision. It also clearly affects people's immunity in the future, as it destroys everything on earth, affecting health human and plants and animals in their death, and causes great differences in climate, the ozone hole increases, red rays will emerge and will not be absorbed by the ozone layer, this will lead to a severe rise in temperatures, and global warming will occur that greatly affects the weather, rain schedules, and other severe damages, due to this severe damage, an agreement was made by Montreal to stop working with this gas. Indeed, what the agreement explains will bring great peace to the ozone layer, and it will gradually return to what it was. If there are problems in the ozone layer, ultraviolet rays will come out and destroy living organisms, and there will be no one to absorb them. It is clear that there are many countries that have completely stopped it after all these dangers it causes (Garza, et al. 2000; Kasuya, et al. 2010).

Alternatives that can be used instead of Freon gas:

Due to the severe damage caused by Freon gas, not only to human health, but also to the entire environment and its animals and plants. It threatens all living organisms, so an alternative was sought to be used to reduce the dangers caused by Freon gas by an agreement called Montreal that requires stopping the use of this harmful gas. It is even called environmentally friendly, meaning it does not cause any harm from its use (Venkatarathnam and Srinivasa, 2008). There are well-known alternatives such as Hydrofluorocarbon does not contain chlorine, and therefore there will be no harm in using it in electrical appliances for cooling, if the use is to dissolve industrial materials, it is preferable to use another alternative, which is alcohol (Zhang and Musgrave, 2007). Therefore, care must be taken to avoid using dangerous Freon in our lives at all, regardless of the reason. Perhaps the most common Freon substitutes turn out to be the brand name R-410A, known as Puron, EcoFluor R410 as well as R-407C, known as Suva 407C, which is a mixture of Freons R32, R125 and R134a.,-290, which is known as propane, which is A very safe and effective, but flammable solvent as well as R-134a, which is commonly used in refrigerators and car air conditioning, and is used for outdoor and industrial refrigeration applications as well as R-717, commonly known as ammonia, which is a flammable solvent that is used in industrial applications(Garza, et al. 2000).

Diagnosis of exposure to gas and chemicals:

The history of the duration of exposure is one of the most important first steps that must be adhered to, in addition to a chest X-ray or computed tomography (CT) scan, as chest In people, but their chest X-ray appears normal, the doctor may place a sensor on the person's finger to determine the amount of oxygen in the blood (pulse oximetry). Lung function tests, including determining the amount of air the lung can hold and the rate of exchange of oxygen and carbon dioxide, are used to assess damage (Zhang and Musgrave, 2007). Although most people fully recover from accidental exposure to gases, more serious complications include lung infection. Or severe damage that leads to scarring of the small airways (bronchiolitis obliterans). Some studies have shown long-term impairment of lung function years after the symptoms of gas exposure (Venkatarathnam and Srinivasa, 2012).

The best way to prevent exposure is to exercise extreme caution when handling gases and chemicals. People using cleaning products or other chemicals at home should work in well-ventilated areas, and gas masks should be available with their own air supply in case of an accidental spill. Farmers need to know that accidental exposure to toxic gases in silos is dangerous and even fatal (Calm, 2008). People should not enter an environment where toxic gases may be present in order to rescue an exposed person unless they have protective equipment.

Handling toxins and gases:

Many cases of poisoning result from inhaling some gases or vapors from toxic liquids cases of inhalation poisoning are characterized by the speed with which the poison reaches the blood, and thus the rapid occurrence of poisoning. Therefore, it is important to provide first aid to the patient in this case as soon as possible from take the necessary precautions to protect yourself before rescuing the injured person, by placing a wet cloth over the nose and mouth and opening windows and doors to expel toxic gases and fumes out. Immediately move the injured person from the atmosphere saturated with toxic gas or vapor to fresh air, freeing the body from compressive clothing, loosening his neckties, and avoiding lighting matches or using a lighter, after the injured person is rescued from danger, he must be examined, his airway, breathing and pulse should be monitored, and rescue breathing and cardiopulmonary resuscitation should be initiated if necessary (Sneader, 2005).

Perform artificial respiration in case of respiratory depression or failure after removing objects from the mouth through tilt the injured person's head back to open the airways, while closing the nose with the finger and take a deep inhale, place your mouth tightly over the victim's mouth, and blow air into his lungs, while monitoring the victim's chest, which rises when the air reaches the lungs, the rescuer raises his mouth so that the injured person can exhale while monitoring the chest depression, previous process is repeated until the injured person regains

normal breathing, the injured person vomits, he must be placed on one of his sides so that he does not suffocate but if the victim is unconscious, do not give him anything orally warm the injured person if he shows signs of cold or chills calm down the poisoned person if he is aware of his surroundings immediately transport the injured person to the hospital(Richter, et al. 2011).

Handling with gases:

Precautions to be taken during raids with toxic chemicals if you are outside and know that you are in the location of toxic gases, try to enter the nearest house, residence, or store. If this is not possible, stay inside the car quietly and turn off the car engine and close the windows well, place a cloth over the car's air vents and cover exposed areas such as: hands and face (Lopata and Govind, 2011). It is also preferable to cover the lower extremities of children and young people and use socks and shoes in advance, when a gas mask is available, it must be used. It is advisable to keep a nylon bag containing a wet towel or wet gauze pieces for use in cases of nerve gases. In cases of mustard gas, it is preferable that the towel or pieces of cloth be not wet (dry), by using them to cover the head, hands, or lower limbs of children, and to cover the car's ventilation holes (Imke, et al. 2009).

In home make ensure that the doors and windows are closed and enter the room designated and previously prepared for use in the event of a war with toxic gases, accompanied by family members, clothing contaminated, remove it immediately, place it outside the home in an airtight container, and then dispose of it. Either burn it or bury it with soda lime wash the body and affected areas to remove remaining toxins and reduce their absorption and can use lukewarm water and soap after ensuring that the water is valid and not contaminated, and be careful not to put it in the mouth, eyes, or nose (Dylan, et al. 2011).

Oxygen therapy is the mainstay of treatment for people who have been exposed to gases, and if the lung damage is severe, the affected person may need mechanical ventilation, but for anyone who has problems breathing after inhaling the gas, they are monitored in the hospital throughout the night to ensure that complications do not occur. Serious. Bronchodilators, intravenous fluids, and antibiotics may be helpful, and corticosteroids are often given to reduce inflammation in the lungs (Schrodinger, 2010; Anant, 2012).

CONCLUSION

As a result of the massive and unlimited use of Freon gas by humans in many human activities, there has been an extremely high increase in its quantities and the percentage present in the upper layers of the atmosphere, where the danger of this gas lies in its decomposition in those special layers of the atmosphere, the upper ones in particular, and This is done through

ultraviolet rays, which leads to the release of chlorine atoms from it, which leads to direct and very high damage to the ozone layer, that important layer, which is necessary to an unlimited extent for all living organisms, and all forms of life on the surface of the Earth due to Because it provides protection for the Earth from ultraviolet rays, which are extremely harmful to all living organisms, and the danger of this gas to the ozone layer through the interaction of chlorine atoms disintegrated from it, causing the expansion of the ozone layer's hole, and for this reason many governments tended to Using other compounds that do not contain chlorine atoms in their composition as an alternative to using Freon gas, in order to avoid its serious and destructive harm to all aspects of earthly life, and even working to dispense with it, completely and completely, within a few years coming to preserve and protect the environment.

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