The Unexpected capacity of Human Body to dissociate the water molecule, like chlorophyll in plants, and dissolved oxygen levels in drinking water. Implications in the study and treatment of COVID 19 patients.

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Abstract.

One of the earliest symptoms in patients affected by SARS-CoV-2 virus is decreased blood oxygen levels. This silent hypoxemia or happy hypoxia is one of several mysteries of the ongoing COVID-19 pandemic. It is amazing that patients with coronavirus disease (COVID-19) present oxygen blood levels incompatible with life and even without dyspnea which is defying basic biology. The explanation for silent hypoxemia is complex and is usually avoided in medical journals.

The purpose of this work is to draw attention to the importance of dissolved oxygen levels in drinking water supplied to the population and their relationship to the current COVID-19 pandemic. This report was prepared in accordance with SQUIRE 2.0 guidelines.

Introduction

Hypoxemia free of dyspnea has confused clinicians who care for COVID-19 patients. It is surprising that massive media outlets like the Wall Street Journal were the first to draw public attention to what they see as a medical mystery as to why "*large numbers of Covid-19 patients arrive at hospitals with blood-oxygen levels so low they should be unconscious or on the verge of organ failure. Instead, they are awake, talking—not struggling to breathe*" [1].

The physiopathology of the mechanisms of happy hypoxia cannot or have not been determined based on current physiology. It is argued that it is because of the way in which respiratory centers respond to low blood oxygen levels, another theory is that CO_2 present in the blood or tissues, obscures the brain response to hypoxia, also the effects of the disease itself due to the age and over the control of respiratory centers, as well as other arguments regarding the inherent biases of pulse oximetry in the presence of low oxygen saturations; as well as temperature-induced changes in the oxygen dissociation curve.

Other theories that have postulated an observation that is inexplicable based on current physiology are the hypoxia thresholds that precipitate dyspnea, tolerance to low oxygen levels, the definition of hypoxemia. But unfortunately, the question remains.

The data found in the literature seem contradictory. See some examples: the effects of endotoxin on ventilation and breath variability [2], it is striking that sensory afferents or hypoxemia elicited significant stimulation of the respiratory centers and the patient did not developed dyspnea [3]. In fact, unpleasant breathing can be recognized only by a patient; it is mainly a subjective symptom;

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symptoms such as tachypnea, tachycardia, facial expression of distress, are not an adequate guide to evaluate dyspnea, because of the individual variability of patient response, as with pain, physical signs may overestimate or underestimate patient discomfort [4].

The respiratory centers are exquisitely sensitive to CO_2 and not to blood oxygen levels. Small increases in $PaCO_2$ rapidly evoke large increases in minute ventilation (VE); an increase in Pa_{CO_2} of 10 mm Hg produces an amount of respiratory discomfort that cannot be tolerated for even a few minutes [5]. By other hand, some abnormal lung mechanics also provoke dyspnea but considerably less than hypercapnia does.

Carotid body monitors the blood's pH, temperature, pCO_2, and pO_2 and thereby modulates cardiovascular and respiratory function primarily through sympathetic tone. It is quite small, and is difficult to find by gross anatomical dissection, but has a large metabolic rate and a high perfusion [6].

The ventilatory and dyspnea responses to hypoxia are heavily influenced by the prevailing $PaCO_2$. Severe hypoxia elicits an effective increase in ventilation only when background $PaCO_2$ exceeds 39 mm Hg [7]. A poorly understood confounding factor is the broad range in respiratory drive between individuals [8]. The chemical drive to breathe (in response to hypercapnia and hypoxia) exhibits as much as 300–600% variation between one subject and the next [9].

Furthermore, pulse oximetry-estimated saturation SpO_2 can differ from true SaO_2 by as much as ± 4 % and in severe affected patients could reach 7 % [10].

Thus, considering current biology and physiology, it does not seem to be a coherent explanation for silent hypoxemia.

Dissociation of the water molecule as the basis of the functioning of the human body

Every form of life on Earth depends on the light coming from the sun, but photonic energy must be transformed into a type of energy susceptible from being used by living beings. The universal transducing mechanism appears to be the dissociation of the water molecule.

To date, only plants and some cyan bacteria were able to perform such a chemical reaction, which is astonishing accurate and has not changed since the beginning of time. Replicating water dissociation in the lab requires heating it to 2000 Celsius degrees.

The dogma prevalent today was that chlorophyll dissociated the molecule from water by releasing molecular oxygen which was expelled into the atmosphere to benefit from other life forms that absorbed it and combined it with glucose produced by the same plants for energy. Hydrogen was considered a simple reducing factor despite molecular hydrogen is the main energy hauler in the entire universe.

The chemical reaction that occurs in plant´s chlorophyll can be represented as follows:

$$2H_2O_{(liq)} \rightarrow 2H_{2(gas)} + O_{2(gas)}$$

Supposedly the plant can store photonic energy in the covalent bonds of glucose. And here the contradictions of current dogma begin since energy cannot be stored.

But let us go back to the supposed beneficial presence of oxygen in the atmosphere. The detail is that the leaf of the tree expels oxygen because it is a toxic gas, and within certain parameters can be lethal. The collective error is based on the mistaken belief that we absorb oxygen through the lungs and then distribute it to every cell in the body, so that they combine it with the glucose that is obtained from food. The combination of oxygen with another substance i.e. to obtain heat is called combustion. However, oxygen reacts abruptly with other substances, thereby it is not possible something like a graduated combustion.

Furthermore, oxygen because of its physical and chemical properties cannot pass through even the thin lung tissues because the water cells contain in high amount tend to repel it. The reason is Oxygen is apolar, like oil; and water is a substance highly polar, thereby they do not mix.

Therefore, the discovery of the unsuspected property of human being tissues to dissociate the water molecule, is a finding that contribute to simplify the prevalent human physiology. Thereby, our body does not absorb oxygen from the air around it but from the water it contains [[11]], as is the case in plants. No living being absorbs oxygen from the atmosphere.

Molecules present in the human body that can dissociate water

The most important molecule in relation to the ability to transform luminous energy into chemical energy through water dissociation is melanin [[12]], which was discovered during an observational study on the blood vessels present in the human optic nerve and its relationship to three main causes of blindness in the world: age-related macular degeneration, diabetic retinopathy, and glaucoma. Figure 1.

Figure 1) Right optic nerve eye photograph. The yellow arrow indicates the presence of melanin at the temporal edge of the optic nerve.

The study last 12 years (1990-2002) and include 6000 patients. Our hypothesis work was trying to identify anatomical clues that could be used as indicators of early disease. Thereby our main variables under study were morphologic characteristics of optic nerve blood vessels. However, in digital magnifications the ever presence of melanin nearby optic nerve draws powerfully our attention and after three weeks, melanin was included as variable under study.

Along twelve years we identify three axioms that finally led us to conclude that melanin has the unsuspected intrinsic property to dissociate and re-form the water molecule. 1) More melanin means less blood vessels and vice versa 2) More melanin in tissues means more oxygen levels in tissue and vice versa 3) Melanin provides the oxygen through the dissociation of the water molecule.

The equation is as follows: $\mathbf{2H_2O_{(liq)} \rightarrow 2H_{2gas} + O_{2gas}} \rightarrow \mathbf{2H_2O_{(liq)}} + 4\ \boldsymbol{e^-}$

The finding that melanin provides energy through water dissociation explains the paradoxical lack of blood vessels in the rod and cones layer in retina, in spite it needs 10 times more energy than cerebral cortex, 6 times more energy than cardiac muscle, and three times more energy than kidney cortex [13].

Our body takes oxygen from inner water and not from surrounding air

Every cell of our body has melanin granules (melanosomes) located mainly in perinuclear space, so they can dissociate water at their own obtaining Hydrogen (H_2) and Oxygen (O_2) at the same time, thereby our body does not need to absorb oxygen from the atmosphere. Molecular oxygen (O_2) present in our cells, tissues and blood stream does not comes from surrounding air instead from water dissociation that happens in every single cell of our body[14].

Oxygen is 300 000 less soluble in water than in air, thereby is not possible that atmospheric oxygen pass through delicate lung tissues due to cell´s water content. However, the water barrier to passage of oxygen acts in the same way to the oxygen that is produced inside. Molecular oxygen is practically useless to our body due to toxicity and reactivity. In fact, is a by-product of water dissociation chemical reaction. Oxygen toxicity and the fact that it is not required to combine it with glucose to generate energy, explain observations that oxygen is severely limited to pass from blood to tissues. Observation that the blood brain barrier (BBB) is impervious to oxygen passage was first described since 1960 [15].

Due to potential negative effects on our body metabolism, there is a rush for expel oxygen from cells, tissues, and systems of our organism. Mother Nature developed, along billion years, a system that consist in add a carbon atom to each molecule of oxygen forming CO_2 or carbon dioxide, which has a water solubility around 12 times greater (25 000 less soluble in water) than Oxygen (300 000 less soluble in water) and with the assistance of an enzyme present in almost living things, carbonic anhydrase. The expelling of CO_2 to atmosphere through the lungs

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contributes to maintain its levels inside our body within narrow physiological ranges of 23 to 30 mEq/L, or 30 to 40 mm Hg. (Figure 2)

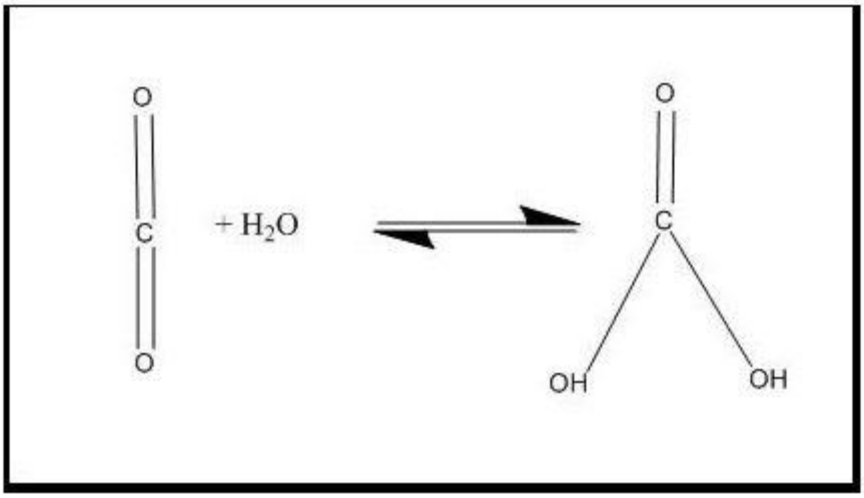

Figure 2) Mechanism of action of carbonic anhydrase. By reducing CO_2, the energy level of the molecule is raised.

Thus, a major part of CO_2 in our blood and tissues coming from the oxygen generated from water dissociation that eukaryotic cells produce constantly, incessantly; to provides and maintains an adequate output of energy (generation and distribution). Probably, the CO_2 derivates from body metabolism is relatively small compared with the amount of CO_2 generated from water dissociation.

Therefore, the unicity of the physical and chemical qualities of water are of greater importance than was believed because it is not only the universal solvent but the perfect substrate for melanin, probably the only one. Thereby, even the slightest change in chemical and physical properties of water would have an impact in turnover rate of water dissociation.

Dissolved Oxygen in Water

The level of dissolved oxygen in water is one of the most important parameters in determining its quality, because it indirectly indicates whether there is pollution of one or more types. Common processes that pollute surface waters include the discharge of organic matter derived from municipal sewage or industrial wastes, and runoff from agricultural lots and livestock feedlots. In addition, the release of warm or hot discharges from industrial cooling towers induces what is known as thermal pollution. Such discharges directly affect the level of dissolved oxygen in water bodies, which is crucial for the survival of aerobic organisms and aquatic fauna such as fish; in fact, excessive pollution has caused massive fish deaths. In the long run, the discharges of organics or of nutrients favor the accelerated eutrophication or productivity process with algal blooms. Therefore, there will be a lowering of the dissolved oxygen content (or DO level) and the “death” of the aquatic system [[16]].

Less oxygen dissolved in the water is often referred to as a “dead zone” because most marine life either dies, or, if they are mobile such as fish, leave the area. Habitats that would normally be teeming with life become, essentially, biological deserts [17]. Hypoxic zones can occur naturally, but scientists are concerned about the areas created or enhanced by human activity. There are many physical, chemical, and biological factors that combine to create dead zones, but nutrient pollution is the primary cause of those zones created by humans. Excess nutrients that run off land or are piped as wastewater into rivers and coasts can stimulate an overgrowth of algae, which then sinks and decomposes in the water. The decomposition process consumes oxygen and depletes the supply available to healthy marine life.

Dead zones occur in coastal areas around the nation and in the Great Lakes — no part of the country or the world is immune. The largest dead zone in the world lies in the Arabian Sea, covering almost the entire 63,700 square mile Gulf of Oman. The second largest sits in the Gulf of Mexico in the United States, averaging almost 6,000 square miles in size [18]. “Dead zones” are deadly: Few or no organisms can survive in their oxygen-depleted, or hypoxic, waters. Often encompassing large swaths of ocean (and even lakes and ponds), dead zones become oceanic deserts, devoid of the usual aquatic biodiversity.

Phytoplankton produce oxygen during photosynthesis, so why do dead zones occur?

For phytoplankton in coastal areas, humans provide superfluous nitrogen and phosphorus in fertilizer form. Phytoplankton use the supplemental nutrients to grow and reproduce in huge blooms easily detectable via satellite images. Zooplankton, small animals that spend most of their lives drifting in water, gobble the abundant phytoplankton, and then small fish consume the zooplankton. The rapid increase in algae produces more animal waste—feces and plankton corpses. Bacteria munch on the animal waste and dying algae that rain onto the ocean floor. The bacterial process of decomposition sucks up oxygen from the water, lowering the amount that remains available. Freshwater, washed into the Gulf from the Mississippi watershed, floats near the surface of the ocean because it is less dense, and therefore more buoyant than the saltwater. This stratification, or layering, prevents oxygen mixing between the freshwater and saltwater layers. It seems that marine life suffocates without oxygen.

A remarkable problem is the presence of high levels of Nitrogen compounds in water, its source includes sewage treatment plants, septic tanks, runoff from roads, lawns, and farms.

Low levels of dissolved oxygen levels in drinking water and COVID -19

Until now, low levels of dissolved oxygen were thought to pose a threat only to marine life, but it was not believed that they could pose a serious threat to human health. However, the evolution of the current pandemic indicates that the real problem behind is the low levels of dissolved oxygen in drinking water supplied to the population. The countries most affected by COVID-19, have in common dissolved oxygen levels in drinking water of about 2 mg/L. Water with these characteristics should not even be used to wash fret.

And at the opposite end, we have countries that have been relatively little affected by the pandemic, for example Taiwan, Hong Kong, Nova Scotia in Canada, and New Zealand, which have not even had COVID-19 deaths. In a very way, there are no significant differences in the strategies to break the contagion chain followed by these countries. But if we stop at the dissolved oxygen levels in the drinking water that is supplied to the population, it turns out that they are equal to or greater than 6 mg/L, which results in adequate quality water so that the body can dissociate it properly, as it has been since the beginning of time.

Dissolved Oxygen levels in drinking water explain the paradox of people living on a street situation. Nowhere in the world, homeless people have been affected. It was thought that they were going to be the first to fall. The explanation is that the only water they are in contact with is bottled water, but they do not wash fret, they do not wash clothes, they do not bathe, they do not cook, they do not clean floors, therefore, for practical aims, they have no contact with water with dangerous low levels of dissolved oxygen. Intensive use of water with low levels of dissolved oxygen leads to magnifying human exposure to the contaminants it contains. So, ideally, all water that meets us should have at least 6 mg/L of dissolved oxygen, not just the water we drink.

Excessive water pollution has caused massive fish and now massive human deaths, because all forms of Earth life have a common origin: the dissociation of the water molecule. Therefore, there is no vaccine against water contamination but care and respect for the environment.

The main function of gas-exchange in lungs is the expelling of CO_2 and not oxygen absorption.

Our body physiology tolerates better oxygen than CO_2. Our brain senses carbon dioxide levels but not oxygen levels in our blood. Minute changes in ventilation only occurs after PaO_2 starts to drop below 60 mm Hg (Normal PaO_2: 75 – 100 mm Hg). Oppositely, even a small increase in the pressure of carbon dioxide in arterial blood ($PaCO_2$) would show large changes in ventilation rates. Even an increase of blood carbon dioxide saturation level by 10 mm Hg can cause respiratory issues that a person cannot tolerate for even a minute. But severe hypoxia only leads to an increase in ventilation when the $PaCO_2$ goes above 39 mmHg.

Thereby, dyspnea occurs when CO_2 levels rise, and not when oxygen drops. Alveolar ventilation is critically important for the elimination of metabolically produced CO_2, as alveolar ventilation that does not increase appropriately with the increased CO_2 production during exercise will result in systemic acidosis secondary to CO_2 accumulation. Thus, alveolar ventilation is an important mechanism for regulation of acid-base balance [19].

The lungs contain about 3×10^8 *alveoli* (little sacs) in which air and blood are brought close together so that gas exchange can occur (theoretically) passively, without energy expenditure. The principal gases exchanged are O_2, which is picked up by the blood through a hypothetic mechanism that has not been found, let alone demonstrated and CO_2, which leaves the blood stream and enters the air spaces of the lung, through a mechanism common to all species, and implies the presence of the same enzyme (carbonic anhydrase) as well as energy expenditure. These gases need to cross the thin alveolar—capillary membrane; this occurs (theoretically) by diffusion. In normal circumstances, the alveolar—capillary membrane presents so slight a barrier to diffusion that the blood in the alveolar capillaries achieves *equilibrium* with the alveolar air before leaving the capillaries [20].

However, the saturation of gases in the bloodstream is far from being passively determined, i.e., by diffusion. And even though Haldane published it in 1897, the wrong explanation has remained, probably because the presence of oxygen in the bloodstream and tissues could not be explained any other way [21]. The diffusion barrier in the lungs consists in the following layers: Alveolar epithelium, tissue fluid, capillary endothelium, plasma, and rede cell membrane. If the anatomy of the lungs was designed to expel CO_2 from the bloodstream into the alveolar space, then it is the ideal anatomy, and so it is repeated in all species.

The controversy over the passage of oxygen into the lungs through diffusion dates to 1871 [22], under Pflüger´s direction. Then came an investigation by Bohr (1890), who concluded that the partial pressure of oxygen is sometimes higher in the arterial blood than in the alveolar air, and that the diffusion theory is therefore insufficient [23]. Bohr, in 1907, published experiments which seemed to demonstrate clearly that active secretion of carbon dioxide may occur [24], a crucial finding corroborated thereafter numerous times.

Gas exchange is considered the process by which oxygen and carbon dioxide move between the bloodstream and the lungs. Theoretically, the primary function of the respiratory system is ensuring a constant supply of oxygen to tissues, as well as remove carbon dioxide to prevent its accumulation. However, this constant supply of oxygen to tissues is entirely theoretical and it has not been proven in any species, including man.

When gases are diffusion through other gases (such as in the alveoli), their rate of diffusion can be defined by Graham´s Law. "The rate of diffusion is inversely proportional to the square root of its molar mass at identical pressure and temperature". This is: the smaller the mass of a gas, the more rapidly it will diffuse. Which is not consistent with what we observe inside the alveoli, because while CO_2 rises 100 times, O_2 only decreases by 5 or 6%, even though CO_2 has almost twice the mass of O_2, so it had to move (theoretically) more slowly than oxygen into the alveolar space.

When gases are diffusing through liquids, for example across the alveolar membrane and into capillary blood, the more soluble a gas is, the faster it will diffuse. However, oxygen is 300,000 times less soluble in water than in the air, and comparatively: CO_2 is 25 000 less soluble in water than in the air. This is: oxygen is about 20 times less soluble in water than CO_2. Therefore, the exchange of gases in the lungs is not explained by diffusion, and the marked increase in CO_2 inside the alveoli, is explained by the active secretion of this gas, mechanism described since 1890 by Bohr. However, to date, the presence of oxygen in the bloodstream cannot be explained by diffusion, even if it appears to come from the atmosphere, that is not possible.

Therefore, the answer for this long-lasting enigma is the presence of molecules in the human body capable of dissociating the water molecule at room temperature, such as melanin, hemoglobin, cytochrome P450, bilirubin, myoglobin, etc. [25].

Thereby, the finding of the unsuspecting ability of the human body to dissociate the molecule from water, such as plants, opens a new picture in biology and physiology, allowing to discard anachronistic explanations and constitutes an advance in knowledge [26].

Clinical applications

The theoretical basis and results of experiments in the laboratory are the basis of clinical practice today, so they must be demonstrated in daily practice.

We carry out a meta-analysis of digital oximetry readings that we routinely perform since 2012 in patients who come to our work center in Aguascalientes, Mexico. The sample is therefore representative of the population that comes to consult at our study centre.

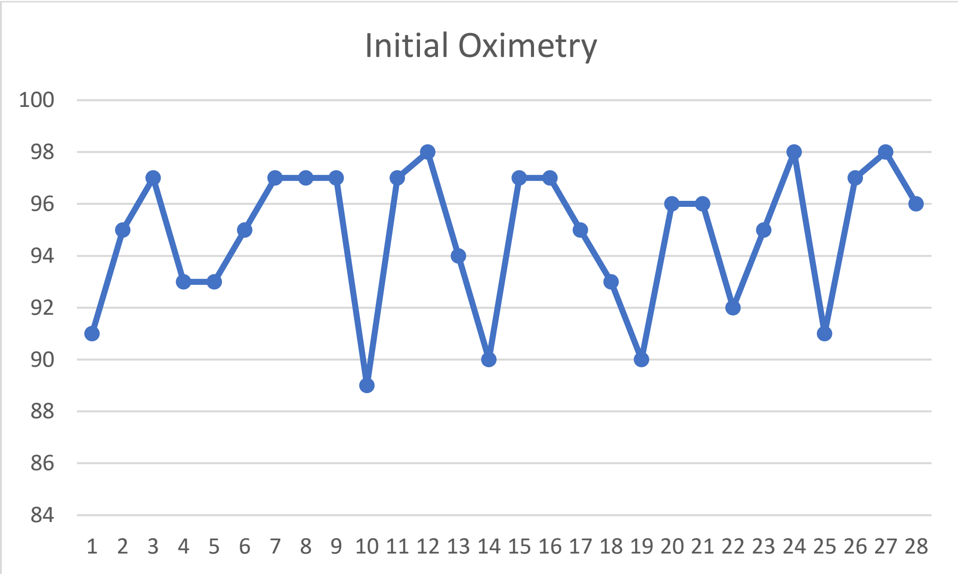

Table 1) N = 28 patients. The readings were held during the first consultation. We do not consider for this sample the patient's name, age, sex, or name of the disease he was going to go to. Axis of abscise: SpO2 %, axis of ordered: the patient's number.

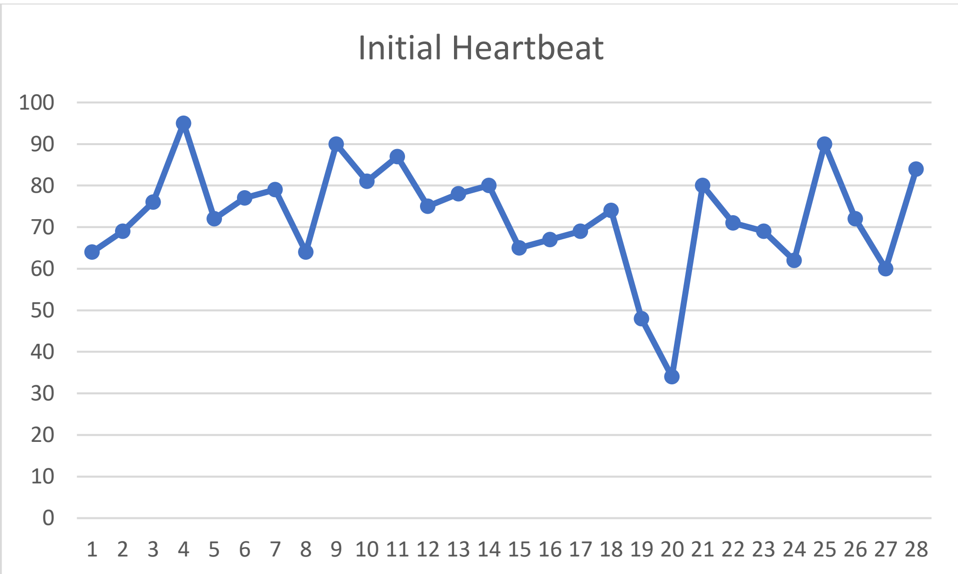

Table 2) N = 28 patients. It is the distribution of heart rate in patients who have been given the oximetry in Table 1. Axis of abscise: heart rate. Axis of ordered: the patient's number.

The distribution of SpO_2% is significantly more homogeneous and with values above 90%, than the values of the heart rate, which has greater variation, so we can infer that the heart rate is not a significant factor in relation to the SpO_2% determined by digital oximetry.

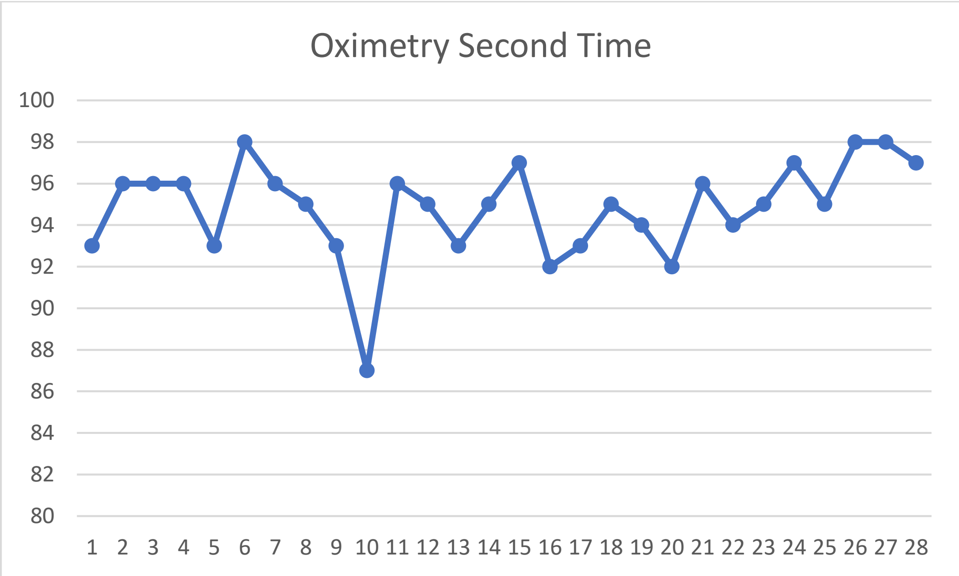

Table 3: There is a significant increase in the values of oximetry after treatment with QIAPI 1©, provided once the patient signed the informed consent. Solely the patient 10 does not show change, however, this patient stopped treatment one month before return to second consultation. Axis of abscissa: SpO2 %, axis of ordered: the patient's number.

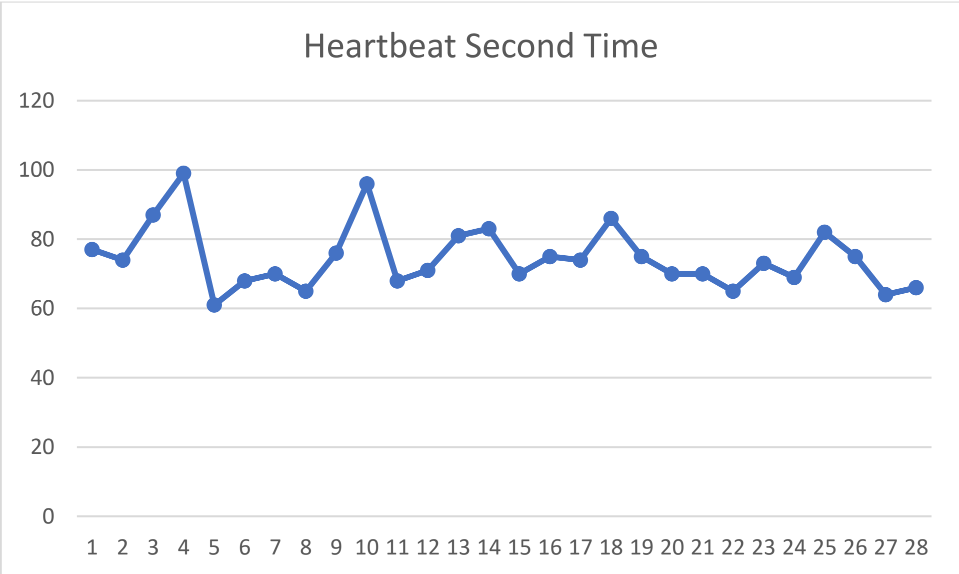

Table 4: Heart rate values show less dispersion compared to values obtained during the first consultation (Table 2). Axis of abscissa: heart rate. Axis of ordered: the patient's number.

The time between the first and second consultations was variable, and it oscillated between a week to months or years, depending on when they went to the second consultation.

The average values of oximetry are raised by pharmacologically stimulating the dissociation of

water in the body; and when the oximetry values rise, the average heart rate values drop.

Figure 3) Melanin is widely distributed in Nature, and its main function is energy transduction through the dissociation of the water molecule.

Discussion:

The presence of the melanin molecule in all biological kingdoms (Figure 3) is now congruent given its unsuspected ability to dissociate the molecule from water, such as chlorophyll, in plants. Every living thing needs energy, continuously. Water dissociation is nature's most used method to transform light energy into chemical energy. Thereby, melanin, the great transducer is everywhere.

Conclusion:

The present health crisis (COVID-19 pandemic) is not a rampant global infectious explosion, but widespread poisoning due to the declining level of dissolved oxygen in drinking water supplied to the population. That is why the usual measures to control infectious vectors have hardly resulted in the consequent catastrophic impact on both human health and other areas such as economic activity, job losses, accelerated poverty increase, increase in affective disorders, etc.

The present is the first communication of several studies that we are conducting to present knowledge about the impact on human health of the declining levels of dissolved oxygen in the drinking water it supplies to the population. This descending in dissolved oxygen levels in drinking water began several decades ago and continues to decline.

Since it was not known that the human body could dissociate the water molecule, the presence of oxygen in body tissues and blood was explained in a reductionist way as coming from the atmosphere. But the lung cannot carry out such gas exchange, as the alveoli are naturally designed to expel CO_2 that continuously forms in our body, but oxygen cannot be absorbed. Recall since 1897, Haldane reported that gas exchange and bloody gas saturation could not be explained by simple diffusion [27].

Therefore, if the levels of dissolved oxygen are not raised in the drinking water that is supplied to populations and cities, the pandemic will not give way and others will follow. There is no vaccine against water contamination and until now, aquatic life seemed to be affected, but reality shows us that as pollution increases, dissolved oxygen levels tend to drop further and are now affecting us, as it has been in previous mass extinctions, where the acidity of oceans increases, and dissolved oxygen levels decrease [28].

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