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Types and Characteristics of Drinking Water for Hydration in the Elderly

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The role of hydration in the maintenance of health is increasingly recognized. Hydration requirements vary for each person, depending on physical activity, environmental conditions, dietary patterns, alcohol intake, health problems, and age. Elderly individuals have higher risk of developing dehydration than adults. Diminution of liquid intake and increase in liquid losses are both involved in causing dehydration in the elderly. The water used for drinking is provided through regular public water supply and the official sanitary controls ensure their quality and hygiene, granting a range of variation for most of its physical and chemical characteristics, being sometimes these differences, though apparently small, responsible for some disorders in sensitive individuals. Hence, the advantages of using bottled water, either natural mineral water or spring water, are required by law to specify their composition, their major components, and other specific parameters. It is essential to take this into account to understand the diversity of indications and favorable effects on health that certain waters can offer.

Keywords Elderly hydration, water classification, types of water, drinking water, natural mineral waters

INTRODUCTION

Water is an essential nutrient required for life. Without water, humans can only survive for days. Water is the major constituent of the human body. Total body water decreases with age, and comprises from 75% body weight in infants to 55% in the elderly. Total body water is distributed into intracellular fluid and extracellular fluid compartments, which contain about 65 and 35% of total body water, respectively. The extracellular fluid compartment is further divided into the interstitial and plasma spaces.

Water has numerous critical roles in the human body. It is essential because all chemical reactions in the body take place in an aqueous medium. Water also contributes to the proper functioning of both organism and cells, since it serves as a carrier of nutrients and substances in the circulatory system. Furthermore, it is the vehicle to excrete products and eliminate waste and toxins (using the cardiovascular system, renal system, and the liver). And it also lubricates and provides structural support to tissues and joints, preserving the good condition of the skin, regulating body temperature, and preventing from constipation. However, there is no efficient mechanism of body's water storage; therefore, a constant supply of fluids is needed to keep the water content.

Under usual conditions of moderate temperature (18–20°C) and with a moderate activity level, body water remains relatively constant. This implies a precise regulation of water balance that is determined by intake [consumed water, beverages, water contained in foods, and metabolic water formed by oxidation of substrates (Hoyt and Honing, 1996)] and wastes [urine (Adolph, 1947), stools (Newburg et al., 1930), the skin, and expired air from the lungs]. The regulation of water balance is essential for the maintenance of health and life. Failure of these mechanisms and subsequent impairments in water balance may produce severe disarrangements that may threaten a person's life.

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Fluid balance studies show that daily water needs increase with age from early infancy (∼0.6 L) through childhood (∼1.7 L) (Goellner et al, 1981; Ballauff et al., 1988). For men adults, the daily water needs of men approach 2.5 L if sedentary (Newburgh et al., 1930; Adolph, 1933) and increase to about 3.2 L if performing moderate physical activity (Gunga et al., 1933; Greenleaf et al., 1977), while more active adults living in a warm environment have daily water needs of about 6 L (Welch et al., 1958; Sawka et al., 2005).

There are age-related alterations in the homeostatic mechanism used to maintain electrolyte and water balance (Luckey and Parsa, 2003). Elderly individuals have higher risk of developing dehydration than adults. Diminution of liquid intake and increase in liquid losses are both involved in causing dehydration in the elderly. The diminution of thirst sensation (Phillips et al., 1984), the decrease of renal ability to concentrate urine, the relative resistance of the kidney to antidiuretic hormone (ADH), the diminution of renin activity, and the low secretion of aldosterone increase the risk of dehydration. In addition, the elderly may encounter difficulties in gaining access to drinks because of diminution of mobility, visual troubles, swallowing disorders, cognitive alterations, and use of sedatives. Fear of incontinence may lead some elderly people to limit their liquid intake. Medicines such as diuretic or laxatives (Ramos Cordero and Nieto López-Guerrero, 2005) can enhance water loss (Jéquier and Constant, 2010).

This review addresses the current knowledge of characteristics and different types of drinking water and the benefits that natural mineral water consumption can provide to ensure adequate hydration in the elderly.

TYPES OF WATERS

In Spain, water used for drinking is provided through regular public water supply (the quality is assessed by physicochemical, biological, and organic analyses) and bottled. Bottled waters are divided in four types: natural mineral water, spring water, prepared water, and bottled water for public consumption.

According to the Royal Decrees: 1798/2010 (2010) and :1799/2010 (2010), both published in December 30th 2010, waters are classified:

a) **Natural mineral waters**: those with microbiologically healthy originates from a subterranean stratum or deposit and emerging from a spring or that can be picked up artificially by sounding, well, ditch, or gallery or a combination of any of them. They can be clearly distinguished from ordinary drinking water: 1° by their nature, characterized by its mineral content, trace elements, and other components, and sometimes, by certain effects. 2° by their constant chemical composition and 3° by their original purity. These features have remained intact, given the underground sources of water that have naturally protected them from any risk of contamination.
b) **Spring waters**: the underground sources that spontaneously emerge on the surface of the earth or that are captured by work performed for this purpose, with pure natural features that allow its use. These features remain intact, given the underground sources of water, through natural aquifer protection against any risk of contamination.
c) **Prepared waters**: waters that are different than natural mineral waters and spring waters, which can have any type of source, and that are subjected to physicochemical authorized treatments necessary for reaching the portability characteristics (drinkable, drinking waters) established.
d) **Human consumption waters**: drinking waters are defined (from the Latin *potabilis*, drinkable) as waters that can be consumed by people and animals without risk of diseases (Fernández-Martín and Cannata-Andía, 2008). Spanish legislation (Real Decreto 140, 2003) establishes that human consumption water must be salubrious and clean, meaning water that does not contain any type of microorganism, parasite, or substance in quantities or concentrations that can constitute a risk to human health and that meets certain requirements, among others: smell, taste, turbidity, color, conductivity, pH, and bacterial contamination. Therefore, the requirements to be met by consumption water are based, according to current legislation, more in terms of consumer safety than in nutritional values (Maraver and Michán, 2010). However, although drinking water contains minerals that can help fill some nutrients (Martín-Ferrer et al., 2008), ordinary drinking water does not meet requirements to rigorously assess its nutritional contribution (Maraver and Michán, 2010).

Natural mineral water is therefore an advisable option to maintain adequate hydration. This fact is due to its **origin**, which is one hundred percent natural; due to its **purity**, since it does not need any disinfection treatment for consumption; due to its **safety**, as this water fully complies with safety and food hygiene regulations that make them suitable for consumption and especially for its **constant composition** of minerals and other components, which provide water with beneficial health properties. Water is the base of all drinks, and it supplies essential minerals. Natural mineral waters contain different types of substances dissolved, mainly minerals and other biological compounds.

CLASSIFICATION OF NATURAL MINERAL WATER

The wide range of different types of mineral waters has led to the introduction of several mineral water classifications. Natural mineral water has gained popularity over the last decades. The increasing number of natural mineral waters for sale at supermarkets raises more questions about the differences between these natural mineral waters, not only when compared to each other, but also when compared to regular tap water. Although the labels on most natural mineral waters indicate their chemical composition, it is often difficult and time-consuming to make a

Table 1 Water classification based on some of their physical characteristics

Origin	Marine	Metamorphics	Magmatics	Plutoniums
Temperature	Colds <20°C	Hypothermals between 20 y 35°C	Mesothermals between 35 y 40°C	Hyperthermals between 45 y 50°C
Osmotic pressure	Hypotonics* <325 mm/L	Isotonics* = 325 mm/L	Hypertonics* > 325 mm/L	
pH	Acids pH<6,8	Neutrals pH between 6,8 y 7,2	Alkalines pH> 7,2	
Hardness	Very soft 0–100 mg/L of $CaCO_3$	Soft between 100–200 mg/L of $CaCO_3$	Hard between 200–300 mg/L of $CaCO_3$	Very hard between 300–400300 mg/L of $CaCO_3$

*Concentrations.

quick and clear comparison. Thus, a classification into various types of water would be useful (Van der Aa, 2003).

Natural mineral waters can be classified according to different criteria. (A) For their use: natural mineral, medicinal mineral (mineral-medicinal), thermal mineral (thermo mineral), and industrial mineral. (B) Based on their origin. (C) Based on their physical characteristics (Table 1): temperature (usually used for cold waters that are tonic and stimulant drinks), pH, osmotic pressure, hardness (Girad, 1973) (ranging from very soft, from 0 to 100 mg/L of $CaCO_3$, to extremely hard when they have more than 400 mg/L). (D) Based on the total salt content in grams after evaporation of 1 L mineral water dried at 180°C (dry residues), mineral waters can be classified (Table 2) as: waters with a very low mineral content, waters low in mineral content, waters with a medium mineral content and strongly mineralized waters (Albertini et al., 2007).

Palmer (1911) divided natural mineral water into five classes on the basis of six special characteristics: (1) Primary salinity (alkali salinity) formed by salts of both strong acids and strong bases; (2) Secondary salinity (permanent hardness) formed by salts of strong acids and weak bases; (3) Tertiary salinity (acidity) formed by salts of strong acids and metals; (4) Primary alkalinity (permanent alkalinity) formed by salts of weak acids and strong bases; (5) Secondary alkalinity (temporary alkalinity) formed by salts of weak acids and weak bases; and (6) Tertiary alkalinity formed by salts of weak acids and metals.

Other water classifications are based on the predominant ionic composition (Kurlov, 1928; Marotta and Sica, 1933; Durov 1948) (cations and anions), and are commonly expressed in percent meq. The name of the water type should be carefully considered to avoid becoming misleading. Water is usually of a mixed type and should be identified by the names of all its important cations and anions and not only by the names of the principal constituents (Zaporozec, 1972). Usually all ions whose percentage composition equals or exceeds 25 percent of the total meq are used in formulating the name. According to their predominant ionic composition, waters can be classified as follows:

Concerning anions	Concerning cations
Bicarbonate waters	Calcium waters
Sulphurous waters	Magnesium waters
Chloride waters	Sodium waters
Bicarbonate sulphate waters	Calcium–magnesium waters
Bicarbonate chloride waters	Calcium–sodium waters
Sulphate chloride waters	Magnesium–sodium waters
Sulphate chloride bicarbonate waters	Calcium-magnesium-sodium waters

A further distinction is based on the concentration of particular constituents. The quantity of free carbon dioxide makes the distinction between fizzy waters (also called carbonic or acidic) and still waters. Radioactive waters are characterized by the presence of measurable radon quantities (1 millimicrocurie of radioemanation) (Petraccia et al., 2006).

The Stuyfzand classification (Stuyfzand, 1986) subdivides the most important chemical water characteristics at four levels: main type, type, subtype, and class of a water sample. The main type is determined on the basis of the chloride content. The type is determined on the basis of a hardness index. The subtype is determined on the basis of the dominant cations and anions. Finally, the class is determined on the basis of the sum of sodium (Na), potassium (K), and magnesium (Mg) in meq/L, divided by chloride (Cl).

Another classification can be based on the biological activity (Petraccia et al., 2006): diuretic mineral waters; cathartic waters (facilitating the hepato-biliary functions through choleretic, cholagogue, cholecysto-kinetics effects and stimulating intestinal functionality either directly or indirectly); waters with antiphlogistic and resolvent properties; and reconstituent waters like ferrous waters (Boccia, 2002).

Some experts have proposed classifications of natural mineral waters based on therapeutic actions. Thus, medicinal mineral waters are waters whose medicinal properties are confirmed by a prolonged experience (Voronov, 2000). Healing waters have

Table 2 Classification of natural mineral waters based on their dry residue, according to R. D. 1798/2010[2]

Designation	Criterion*
Of very weak mineralization	Up to 50 mg/L of dry residue
Oligometalics or weak mineralization	Up to 500 mg/L of dry residue
Of intermediate mineralization	From 500 mg/L up to 1.500 mg/L of dry residue
Of strong mineralization	More of 1.500 mg/L of dry residue

*Designations based on contents.

pharmacological and clinical properties related to prevention and treatment of specific pathologies. They are used in thermal establishments, under medical control, for drinking, inhalations, irrigations, baths, and muds (Petraccia et al., 2006). In Germany, a mineral water is considered as curative water if it contains at least 1.0 g/L of dissolved minerals. A further specification is introduced on the basis of the characteristic compounds, of which the equivalent contribution must constitute at least 20% of the total dissolved compounds. Moreover, a further specification can be added on the basis of some characteristic elements that exceed a certain concentration limit (Van der Aa, 2003). In a report performed by the Geology and Mines Institute of Spain, López-Geta and Baeza (1986) state that natural mineral medicinal waters can be grouped depending on their therapeutic effects on the following criteria:

1) According to effects on the body
2) According to the pathologies on which they have beneficial effects
3) According to the organ or function on they act:

a. Digestive system, nutrition, and skin
b. Circulatory and respiratory system
c. Locomotor system (rheumatism)
d. Nervous system

However, these classifications are not completely accurate because most of the waters are of complex behavior and can have different effects on the body. For this reason, many countries have introduced mixed classifications taking into account both the chemical compositions and therapeutic actions. However, the most widely used, according to the European Union mineral water directive, are the classifications based on (1) total dissolved solids (TDS) with a very low mineral content, waters low in mineral content, waters with a medium mineral content, and strongly mineralized waters and (2) a further specification based on some characterizing cations and anions or carbon dioxide content (Table 3).

Table 3 Classification of natural mineral waters based on their mineral element quantity, according to R. D. 1798/2010[2]

Designation	Criterion*
Bicarbonate	More of 600 mg/L of bicarbonate
Sulphate	More of 200 mg/L of sulphate
Chloride	More of 200 mg/L of chloride
Calcium	More of 150 mg/L of calcium
Magnesium	More of 50 mg/L of magnesium
Fluoride or that contain flour	More of 1 mg/L of fluoride
Ferrous or that contain iron	More of 1 mg/L of bivalent iron
Acidulade	More of 250 mg/L of carbon dioxide
Sodium	More of 200 mg/L of sodium

*Designations based on contents.

Natural Mineral Bicarbonate Waters

They have a dominant composition of bicarbonate anion (> 600 mg/L). They are cold and alkaline waters with low mineral content and diuretic properties. They may neutralize acid secretion and decrease gastric pH, aid digestion, accelerate gastric empting, stimulate pancreatic secretion and act on the overall metabolism. Its consumption lowers plasma aldosterone levels, thereby promoting increased urinary sodium excretion without changing potassium urinary excretion (Schoppen et al., 2005a, 2005b; Schoppen et al., 2008). There are different types if other minerals that are present in the water are considered.

The sodium bicarbonate waters may treat gastric disorders, dyspepsia, diarrhea, liver disease, and kidney stones. A significant reduction in total cholesterol (6.3%) in LDL cholesterol (10%) and in the glucemia has also been detected after the ingestion of sodium bicarbonate mineral water (Schoppen et al., 2005a, 2005b).

The calcium bicarbonate waters help digestion and dyspepsia. They decrease bone resorption better than simply calcium waters (Wynn et al., 2007). The intake of bicarbonate waters with medium mineralization induces a significant reduction in serum uric acid (Bertaccini and Borghesi, 2009). Similarly, it has been shown that the ingestion of bicarbonate-alkaline water protects against oxidative stress and development of gastric lesions produced by ethanol consumption (Nassini et al., 2009). The protective effects of natural mineral bicarbonate-alkaline sulphate and sulphurous water administration (Nappi et al., 2003; Benedetti et., 2009; Guzmán Martínez et al., 2010) against the free-radical damage of lipids, proteins, and DNA were linked to a significant increase in the total antioxidant capacity (TAC) of plasma. This increase in TAC values was possibly related to the significant increase in total—SH levels, which include both protein (principally albumin) and nonprotein (cysteine and GSH) thiol groups.

The bicarbonate-sulphate waters are indicated in constipation and liver intoxications, while the chloride bicarbonate is commonly used to treat rheumatism.

Natural Mineral Sulphate Waters

In this type of water, the predominant element is the sulphur which is present in natural mineral waters as sulphate anion (>200 mg/L) with different cations. They have laxative or purgative effects, and they are choleretic, cholagogue, and stimulate intestinal motility. In addition, when they do not have sodium, they have diuretic effects (Maraver Eyzaguirre 2009). Mineral natural waters rich in calcium sulphate seem to improve the gastric pH (Guliaev et al., 2008). We can also find other elements such as bicarbonate, calcium, magnesium, and chloride. There are several types.

- Sodium and magnesium sulphate waters are purgative-laxative and they are used in food and medicinal intoxications.

- Chloride sulphate waters stimulate intestinal motility and are mainly indicated in chronic primitive constipation and for other digestive and hepaticbiliary disorders.
- Calcium sulphate and calcium bicarbonate sulphate waters. Its diuretic action helps to eliminate uric acid. They have also been used to treat gastritis, dyspepsia, and disorders of the biliary tract.

Natural Mineral Chloride Waters

In this type of water, the predominant element is the chloride (>200 mg/L), and the most abundant cations are sodium, calcium, and magnesium. These waters stimulate intestinal peristalsis and intestinal secretion of water and electrolytes. They have a choleretic and cholagoge action by increasing biliary secretion and bile inflow into duodenum. They are used in primitive constipation, irritable colon, and biliary pathology (Martínez Alvarez, 2011). They are stimulants of several functions.

Natural Mineral Calcium Waters

Calcium is an essential component (>150 mg/L) of the mineral water, especially in the low mineralization waters. Its presence in the body is essential, since the functions involved are in the nervous system, heart, muscle, blood clotting, and bones formation. Mineral water rich in calcium are indicated when calcium requirements are increased (children, pregnant women, menopause, old age, and osteoporosis) Petraccia et al., 2006. The calcium waters prevent from osteoporosis, tooth losses, and insomnia. Roux et al., (2004) have found that drinking mineral water with high content in calcium has the same effects as calcium coming from a food source, therefore the mineral content of water could be used in the prevention of mineral degradation of the bone (Fernández Seara et al., 2004). Burckhardt (2004) has observed that the calcium found in natural mineral waters is better absorbed than the calcium from milk and it is independent from the calcium concentration in a given water. This source of calcium has additional advantages such as good tolerance and does not provide calories or fat (Martín-Ferrer et al., 2008). In addition, the bioavailability of calcium in different types of waters (rich in calcium and with gas) is similar to the calcium present in different lacteous products or dietetic supplements (Couzy et al., 1995; Bacciottini et al., 2004; Heaney, 2006). Besides, the oral intake of water containing calcium increases serum calcium and inhibits intact parathyroid hormone secretion (Cantalamessa and Nasutti, 2003).

The calcium content of water used for hydration may vary from very low to relatively high, and is an important factor in the prevention or additional risk of stone formation (Weder and Egan, 1991).

Natural Mineral Ferrous Waters

In this type of water, the predominant element is the ferrous (>1 mg/L). Most of them are cold. Ferrous waters are indicated in sideropenic anemia hyperthyroidism and they are nutrition stimulants. The bioavailability of iron in these waters is very high due the presence of other trace elements: copper, manganese, lithium, zinc, or aluminum. It is recommended for use during pregnancy and more specifically in the treatment of anemia. Halksworth et al., (2003) detected an increase in iron absorption and an improvement in plasma after ingestion of water with a high iron content. This form of iron supplement may be an alternative to the use of supplements of ferrous sulphate, thus avoiding secondary digestive effects.

Natural Mineral Sodium Waters

In this type of water, the predominant cation is the sodium (>200 mg/L). Its action on the body is significant because it is predominantly spread (91%) in all tissues and extracellular spaces and a minority (9%) intracellularly. It is involved in a large number of biological processes under its ionic form, being significant its regulatory action on the extracellular fluid volume and osmotic processes, but also in maintaining acid-base balance of the environment and as an activator of many enzymatic processes. Natural mineral sodium waters are not recommended in cardiovascular diseases and hypertension due to the close correlation between sodium chloride intake and hypertension. However, in most natural mineral sodium waters, the predominant ion accompanying is bicarbonate and not chloride and for this reason, has no effect on arterial blood pressure (Maraver Eyzaguirre, 2009) because the sodium ion appears to be hypertensive only as chlorinated and non in bicarbonate water (Chapuy, 1986). In short, the effect of sodium on blood pressure depends mainly on the corresponding anion (Maraver Eyzaguirre, 2009). Santos et al. (2010) have found that the effect of sodium bicarbonate on blood pressure is much lower than for equivalent amounts of sodium chloride.

Natural Mineral Magnesium Waters

The high availability of magnesium in the water (>50 mg/L) makes it one of the best sources of supply. In the body, magnesium is a cation which is held in the intracellular space involved in the central nervous system and it is an activator of enzymatic systems that catalyzes oxidative phosphorylation and energy production. Magnesium waters are mainly cathartic and recent studies have indicated that they may prevent from atherosclerosis. They are useful in obstetric-gynecologic pathologies: premenstrual syndrome, climaterium, and postmenopausal osteoporosis (Petraccia et al., 2006). Several epidemiological studies indicate that there is an inverse relationship between magnesium water intake and development of ischemic heart disease,

arrhythmias, sudden death and cerebrovascular disease (Marx and Neutr, 1997; Yang, 1998). While the main source of magnesium comes from food (especially vegetables, grains, nuts, and fish) the high bioavailability of this mineral in the water makes it one of the best sources of supply (Marx and Neutr, 1997; Azoulay et al., 2001).

Natural Mineral Carbonic Waters

They are also called carbonic or acidulated. They are characterized by high contents of free CO_2 (>250 mg/L). The CO_2 gives mineral water a peculiar "acid" taste and its temperature is usually low. Carbonic waters are prevalently characterized by the presence of bicarbonate anion. Carbonic bicarbonate waters are mainly used as table water and their intake with meals stimulates mucosals which are in contact with it. In the stomach, it excites gastric secretion, stimulates motility, and produces vasodilatation. In the first sections of the intestine, it also produces a stimulating action of peristaltism and a secretion of bile. They are indicated in processes related to gastric hyposecretion, in elderly subjects with difficulty for correct food insalivation, and in all ages for stimulating the appetite (Armijo, 2002; Maraver Eyzaguirre, 2009).

Oligomineral Waters

They are low mineralized waters characterized by the presence of a large number of ions. Among the cations, sodium, calcium, magnesium, potassium, manganese, iron, copper, zinc, etc. can be included, and between anions: chloride, sulphate, bicarbonate, fluoride, bromide, iodide, etc. Those with lower temperatures (below 20°C), cold or acratopegas are mainly used in beverage, being their main action the diuretic function, because they increase the urinary excretion and have dragging effects for renal liatiasis (uric, oxalic and cisteinics), gout, and functional alterations of secretory pathways. The effects of these waters do not depend exclusively on their hypotonic characteristic but depend on their mineral content as well, many of these traces elements acts as catalytics of enzymatic reactions of important biochemical pathways (Albertini et al., 2007).

Table 4 includes some of the following indications point out the main properties based on favorable effects on health that certain waters can offer, and that according to R.D 1798/2010 (Real Decreto, 2010) may appear on the label: "may be diuretic," "may be laxative," "stimulates digestion," "may facilitate hepatobiliary functions," "suitable for preparation of infant food," and "suitable for low-sodium diets." It should be noted that when they are indicated to have a diuretic effect in most cases, their dry residue is below 500 mg/L and therefore they very low mineralization (less than 50 mg/L) or oligometalic of low mineralization waters (Maraver Eyzaguirre, 2009).

Table 4 Classification of natural mineral waters based on their indications, according to R. D. 1798/2010[2]

Designation	Criterion*
Suitable for infant food	—
Suitable for low sodium diets	Up to 20 mg/ de sodium
May have laxative effects	—
May have diuretic effects	—

*Designations based on contents.

SIDE EFFECTS OF SOME NATURAL MINERAL WATERS

In general, side effects are rarely found in this type of waters owing to their easy tolerance, but revival of some symptoms that may appear again disappears with a reduction of the intake. Waters rich in sodium are contraindicated in hypertension, similar to sodium chloride waters in acid hypersecretion, peptic ulcer, and hypertension. Bicarbonate waters in gastric hypochilia and sulphate waters in digestive diseases with ulcerative lesions (Boccia, 2002; Petraccia et al., 2006). Mineral waters with low salts content are recommended for crushed diets and for lyophilized diets as well as dilution of powdered milk (baby's bottle) because children fed with hyperosmolar diets could become obese or hypertensive (Cocchi, 2002; Passeri and Zanardi, 2002).

REASONS FOR DRINKING NATURAL MINERAL WATER

1. Natural mineral water is a recommended option to maintain adequate hydration. This fact is due to its **origin**, which is one hundred percent natural; due to its **purity**, since it does not need any disinfection treatment for consumption; due to its **safety**, as this water fully complies with safety and food hygiene regulations that make them suitable for consumption and especially for its **constant composition** of minerals and other components, which provides water with beneficial health properties. By contrast, regular public water supply, although it contains minerals that can help to obtain some nutrients, due to their variable content, does not meet the requirements to rigorously assess its nutritional contribution.
2. Natural mineral water is a recommended option to maintain an adequate hydration due to its purity, since it does not need any disinfection treatment for consumption. Exposure to water disinfection by-products (DBPs) via ingestion of drinking water is now recognized as a secondary health risk, and is a major concern in developed countries (Cedergren et al., 2002; Nieuwenhuijsen et al., 2009).
3. Although regular public water supply (tap water) has a good quality and is cheap, bottled mineral waters have been increasingly used by consumers for their convenience and for

their beneficial effects coming from their mineralizing elements.
4. Each natural mineral water is different and has a distinctive taste, due to its unique and constant mineral composition, which by law is reflected in their labelling. This allows the consumer to choose one type of water according to its taste, mineral content, and preference or possible due to healthy indications derived from its mineral content.
5. Regular consumption of mineral water has no preventive or curative effects or any disease, but it can help in some cases to alleviate some troubles, if it remains regular intake during some time.
6. The mineral waters are natural solutions, hardly artificially reproducible, endowed with peculiar properties, which can be used for their favorable effects on health, and that they are declared of public utility for competent official agencies.
7. The fact that the composition is constant assures us that the intake of certain elements is known and unchanging, which prevents certain individuals from the ingestion of large quantities of some elements that could be harmful for them.
8. The consumption of natural mineral water is an important vehicle for the supply of mineral.

GENERAL FEATURES OF WATER TO DRINK IN THE ELDERLY

- The water should not contain gas to avoid flatulence, except in exceptional cases where they are prescribed to prevent dyspepsia.
- Drinking mineral water with high content in calcium has the same effects as calcium coming from food sources; therefore, the mineral content of water could be used in the prevention of mineral degradation of the bone (Fernández Seara et al., 2004).
- Calcium found in natural mineral waters is better absorbed than calcium from milk, independently from the calcium concentration in that given water (Burckhardt, 2004).
- The water must not be very rich in minerals, to prevent hydroelectrolitics imbalances and decompensations of diseases such as arterial hypertension, congestive heart failure (Ramos Cordero et al., 2006: Martínez Alvarez et al., 2008; Documento Consenso, 2010), etc.
- It is not necessary that all external intakes of fluids take place exclusively at the expense of water, alternatives can be used to adapt to the individual desires with milk, juices, infusions, tisanes, stocks, soups, jellies, some coffee (Martínez Alvarez and Iglesias Rosado, 2006), etc.
- In summer using water-rich foods: whole milk or preferably skimmed milk or semi-skimmed milk, yogurt, vegetables, fruits (Martínez Alvarez and Iglesias Rosado, 2006), etc.
- Water should be taken at an agreeable temperature. The temperature is considered optimal between 12 and 14°C. Colder temperatures should be avoided to prevent from throat irritation.
- Isotonic drinks are recommended. Their carbohydrate content should not exceed 12% of its total content, in order not to interfere with liquid absorption.
- To search strong tastes, with edulcorates, included lemon, lima, etc. because they increase appetite and are very useful for deglutive problems.
- Natural mineral waters with the lowest salt content possible, specially very weak mineralization waters, must be chosen to prevent electrolyte imbalance and decompensation of blood pressure and because they can be crucial in the treatment of a chronic failure.

CONCLUSIONS

1. In order to typify a mineral water, and therefore evaluate it nutritionally, it is necessary to asses not only the ionic composition but also the dry residue data to determine their indications.
2. There are numerous types of natural mineral water which allow us to select the one that is best suited to our needs.
3. The consumption of bottled mineral water can improve physiological parameters, and can also help stabilize others.
4. Given the influence of saline intake on blood pressure values in case of hypertension, mineral water with low sodium chloride content should be selected for consumption.
5. Waters of weak or very weak mineralization are recommended for a wider range of population, while those of strong mineralization, although they provide a significant mineral contribution, have a more restrictive use.

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CONFLICT OF INTEREST

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