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WATERY DIARRHEA OVER VIEW

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بسم الله الرحمن الرحيم

(نَرْفَعُ دَرَجَاتٍ مَّن نَّشَاءُ وَفَوْقَ كُلِّ ذِي عِلْمٍ عَلِيمٌ..)

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WATERY DIARRHEA OVER VIEW

INTRODUCTION

Watery diarrhea means that you have liquid stools—usually, it occurs three or more times in one day.[2] Diarrhea sometimes comes with a sudden and urgent need to use the restroom or a complete lack of control over your bowel movements. When these symptoms appear and how long they will last depends on what is causing them In many cases, watery diarrhea will go away on its own without any treatment. However, this isn't always the case Immediate medical attention should be sought if diarrhea lasts longer than two days for adults or 24 hours for young children and infants .Medical attention should also be sought diarrhea is accompanied by fever, severe abdominal or rectal pain, black or bloody Stools, or any signs of complications like dehydration, depending on the cause of the illness[3], diarrhea can sometimes coincide with other gastrointestinal issues like nausea, vomiting, loss of appetite, or cramping, while often harmless and fleeting, watery diarrhea can lead to more serious conditions in some cases, the two primary complications caused by watery diarrhea are dehydration and malabsorption.[1]

Dehydration

Having watery diarrhea, can be easy for body to lose more fluids than it takes in.This is called dehydration[4], and it can be especially dangerous for small children. The human body mostly consists of water. It needs water to function properly. When it doesn't have enough fluids, that can cause serious issues, including not having enough blood volume (called hypovolemic shock), kidney failure, or even death, young infants are particularly at risk for dehydration

because their small bodies aren't able to store as much water older children and adults.

When babies lose fluids through watery diarrhea, it can be tough to replenish them quickly enough to prevent dehydration [5]. This is especially true if the illness causing the diarrhea is also making the baby vomit or reject feedings. For this reason, diarrhea is one of the biggest killers of children worldwide, taking lives of more than 2,000 kids every day, largely in developing nations. Signs and symptoms of dehydration can be different in children and adults, but generally speaking, they include[6]:-

- Thirst
- Dark-yellow or brown urine
- Needing to urinate less often than usual
- Fatigue or lack of energy
- Dry mouth Lack of tears when crying (in young kids and older infants who have started crying with tears)
- Decreased skin turgor (when you pinch and release a section of skin, there is a delay before skin flattens and returns to normal)
- Sunken eyes, cheeks, or a soft spot on an infant's skull
- Feeling lightheaded or fainting

Malabsorption

When the body doesn't absorb enough of the nutrients it needs after eating or drinking, which can lead to malnourishment[7].While diarrhea itself doesn't necessarily cause malabsorption, some infections that cause diarrhea such as parasites can also disrupt the body's ability to digest food properly and take in nutrients it needs.

signs and symptoms of malabsorption include:-

- Bloating, abdominal discomfort, or gas
- Changes in appetite
- Weight loss or (in children) slowed weight gain

ETIOLOGY

A wide variety of germs can cause watery diarrhea, many of which are spread through contaminated food, water, or objects [8]. The overwhelming majority of cases are caused by viral, bacterial, and parasitic infections. However, certain health conditions can also prompt diarrhea to occur.

1- Viruses

Viral gastroenteritis occurs when a virus infects the intestines, prompting watery diarrhea along with other gastrointestinal symptoms such as cramping and nausea. These viruses often run their course and don't have medications available to treat them, a lot of viruses can infect the intestines, but some of the most common ones are rotavirus, norovirus, adenovirus, and astrovirus.

Rotavirus:- is the most common cause of diarrhea in the world, accounting for 40% of diarrhea-related hospitalizations in young children [9]. In areas without rotavirus vaccination, it is estimated that nearly all kids will become infected with rotavirus at some point during early childhood, often before their first birthday.

Norovirus:- is a highly contagious stomach bug being responsible for roughly one in five cases of acute gastroenteritis worldwide and is the most common cause of foodborne disease in the United States. The virus leads to roughly 400,000 emergency room visits every year in the United States-most cases are in young children [10].

Astroviruses:- Globally, one of the most common causes of watery diarrhea in young kids and adults with weakened immune systems. Most cases will clear up on their own within a few days [11].

Adenoviruses:- While adenoviruses are typically associated with the common cold or pink eye, this group of viruses can cause mild diarrhea that can last up two weeks [12].

2-Bacteria

bacterial infections are another common cause of watery diarrhea. There are several types of bacteria most often associated with watery diarrhea [13].

Cholera:- rarely spotted in affluent countries like the United States, but outbreaks of the Bacteria are common in low-income countries, An estimated 1.3 to 4 million happen every year, and cause between 21,000 and 143,000 deaths worldwide[14], most people infected with the bacteria won't present any symptoms at all, though they can still spread the bacteria to other people through their feces, when symptoms do occur, watery diarrhea- frequently called "rice water stools" because it looks like the water left after washing rice- Is the most characteristic sign of the disease, followed by vomiting and cramps (15), In more serious cases, both kids and adults alike can die within a matter of hours due to severe dehydration .

Campylobacter:- is common cause of foodborne disease in the United States, resulting in an estimated 1.3 million cases every year [16]. The bacteria are spread primarily through undercooked poultry, but they're also found in unpasteurized milk and contaminated water, most people with a campylobacter infection won't need antibiotics or medical attention to recover-the illness will eventually clear up on its own**.**

Escherichia coli (E. coli):- a group of bacteria that can cause a wide range of symptoms. Some strains cause gastrointestinal discomfort, while others cause respiratory illnesses, urinary tract infections, and other types of illnesses, the

kind of E. coli that causes watery (and sometimes bloody) diarrhea is the Shiga toxin-producing E. coli (STEC), which is spread through contaminated food or drinks [17]. Common foods include raw or undercooked ground meat, raw vegetables, and sprouts .

Salmonella :- an estimated 1.2 million illnesses and 450 deaths annually in the United States [18]. Most of the time, the diarrhea, cramps, and fever associated with salmonella infection go away on its own without treatment, but some cases can prompt diarrhea so severe they require hospitalization, infections are predominantly linked to contaminated food-the bacterium is found in a range of raw and processed foods, including sprouts, nut butters, and chicken nuggets-but the bacterium can also spread from animals to people [19].

Shigella:- an infection of the bacterium Shigella-usually start feeling sick about one to two days after they eat or drink something contaminated with the bacteria or have sexual contact with someone who is (or recently was) infected. Symptoms typically go away within a week, but it can sometimes take months for bowel movements to go back to normal, kids are the most likely to get shigellosis, though travelers, men having sex with men, and those with weakened immune systems are also at an increased risk of becoming infected. The foods associated with shigellosis are salads, raw vegetables, milk, and dairy products .

Clostridium Difficile :-infections of this diarrhea causing bacterium are often a side effect of using antibiotics. As a result, it primarily impacts those who frequent medical facilities or have prolonged stays in hospitals, the CDC estimates nearly half a million infections and roughly 15,000 deaths happen each year in the United States alone (20).

3-<u>Parasites</u>

While rarely seen in higher-income nations, parasitic infections are a frequent and Persistent cause of chronic diarrhea in areas with poor access to clean water

and sanitation [21]. There are many different types of parasites that could contribute to watery diarrhea.

Cryptosporidiosis :- "crypto" is caused by microscopic parasites that infect the intestines. These parasites have a tough outer shell that protects them from disinfectants, including bleach. This is why it has remained fairly common in the country's improved sanitation and clean drinking water, crypto is particularly common in diaper-aged kids who attend daycare, people who swim in or drink from contaminated water sources (like streams or lakes), and those who travel internationally [22].

Cyclosporiasis :- Caused by another microscopic parasite, cyclosporiasis is brought on by eating food and water contaminated with Cyclospora cayetanensis. It is transmitted by feces or feces-contaminated water, the parasite is too small to be seen by the naked eye and makes its home in the small intestine, where it causes frequent (and sometimes explosive) watery diarrhea. The diarrhea can last anywhere from a few days to more than a month [23]. The symptoms can also go away and come back several times if the infection is left untreated .

Giardia :- giardiasis is an infection in the small intestine by the parasite Giardia lamblia. He tiny parasite is most frequently transmitted through contaminated water sources and poor hygiene, cases don't always result in symptoms, but an asymptomatic person- someone who doesn't show symptoms-infected with the parasite can still shed it in their stools. When symptoms do happen, foul-smelling and watery diarrhea is the most obvious characteristic, along with sulfurous gas, bloating, and stomach cramps [24].

4-Other Causes While infectious diseases are the most common cause of watery diarrhea, some non- infectious health conditions can lead to persistent or chronic diarrhea. These include:

- Lactose intolerance[25]
- Celiac disease

- Crohn's disease
- Irritable bowel syndrome (IBS) [26]
- Certain medications or long-term use of antibiotic .

PATHOPHYSIOLOGY OF WATERY DIARRHOEA

There are two principal mechanisms by which watery diarrhea occurs: i)secretion, and ii) osmotic Imbalance. Intestinal infections can cause diarrhea by both mechanisms, secretory diarrhea being more common [25], and both may occur in a single individual .

Secretory diarrhea

Secretory diarrhea is caused by the abnormal secretion of fluid (water and salts) into the small bowel. This occurs when the absorption of sodium by the villi is impaired while the secretion of chloride in the crypts continues or is increased. Net fluid secretion results and leads to the loss of water and salts from the body as watery stools: this causes dehydration. In infectious diarrhea, these changes may result from the action on the bowel mucosa of bacterial toxins, such as those or Escherichia coli and Vibrio cholerae 01. or of viruses, such as rotavirus; other mechanisms may also be important (WHO1992).

Osmotic diarrhea

The small bowel mucosa is a porous epithelium: water and salts move across it rapidly to maintain osmotic balance between the bowel contents and the blood. Under these conditions, diarrhea can occur when a poorly absorbed, osmotically active substance is ingested If the substance is taken as an isosmotic solution, the water and solute causing diarrhea. Purgatives, such as magnesium sulfate,

work by this principle. The same process may occur when the solute is lactose (in children with lactase deficiency) or glucose (in children with glucose malabsorption); both conditions are occasional complications of enteric infections. will simply pass through the gut unabsorbed, (in If the poorly absorbed substance is taken as a hypertonic solution, water (and some electrolytes) will move from the ECF into the gut lumen, until the osmolality of the intestinal contents equals that of ECF and blood. This increases the volume of the stool and, more importantly, causes dehydration owing to the loss of body water. Because the loss of body water is greater than the loss of sodium chloride .

DIAGNOSIS

a-Physical Exam :- before running tests, will likely conduct a physical exam. Checking blood pressure and pulse and take temperature to verify that there are no signs of serious dehydration, then, might use a stethoscope to listen to abdomen for specific sounds and feel abdominal area to check for any tenderness or pain. While it's not routine, doctor might also check rectal area (by inserting a gloved finger into anus) to check for blood stool, also asking some questions to get more information regarding symptoms, including how long been having watery diarrhea, how frequently have to use the bathroom, what stool looks like (color, consistency, any strange odors), and if having any additional symptoms like nausea or fever, additionaly, asking if recent travels or received antibiotics in the past1 to2 months.

B- Tests :-most common diagnostic tool to determine the cause of watery diarrhea is a stool test. Blood tests, a hydrogen breath test [20], fasting tests, or an endoscopy might also be used .

Stool Test :- these tests examine stool samples to see if they show indications of germs. A Stool test may show germs such as bacteria or parasites, blood, or signs of other health conditions.

Blood Tests :-blood samples can be tested for a range of diseases or disorders that can prompt watery diarrhea. This type of test could indicate a health condition related to your watery diarrhea, such as celiac disease.

Hydrogen Breath Test:- Most often used to diagnose lactose intolerance, a hydrogen breath test looks for unusually high levels of hydrogen in the breath due to undigested lactose reaching anaerobic bacteria in the colon, this test is conducted by drinking something containing lactose and breathing into a device that measures hydrogen levels. A high level indicates lactose intolerance.

Fasting Tests:- If watery diarrhea is caused by a food allergy or intolerance, fasting tests can help to determine what food specifically is causing the issue by avoiding specific 10ods to see if the watery diarrhea goes away. Some cases, recommend an elimination diet, where cut out a list of foods (lactose or wheat) and reintroduce them into diet to see body responds.

Endoscopy:- endoscopic procedures (such as colonoscopy and upper endoscopy) use an instrument called an endoscope to look inside the body to spot potential causes of diarrhea[29].

TREATMENT

Watery diarrhea is most often treated by either addressing the root cause of the illness (such as a bacterial infection) or by using medications to lessen severity of diarrhea [30]. If the illness is caused by bacteria, antibiotics are sometimes used to treat the infection, especially if diarrhea doesn't go away on its own, if the symptoms are the result of a parasitic infection, anti-parasite medications are sometimes prescribed. However, not everyone with watery diarrhea will require

treatment. Many cases clear up on their own within a few days. Even without treatment, it's important to prevent complications like dehydration until the watery diarrhea goes away.

Prevent Dehydration

- Drink plenty of water
- Avoid caffeine
- Replenish electrolytes

If have nausea or vomiting, taking tiny, frequent sips (as opposed to big gulps) of water can help the fluids stay down. In addition, caffeinated beverages and other diuretics should be avoided .The caffeine in coffee and sodas can block body from absorbing fluids, making you pass liquids more frequently than you normally would. Alcohol can do the same thing, so that Is also best avoided, Electrolytes are found in a wide variety of sources, but the easiest place to get them is through drinking beverages with a small amount of salt [31](water should be primary drink), sports drinks and special hydration fluids like Pedialyte work well, or adding a pinch of salt to lemon water and adding a small amount of sweetener, like sugar or a sugar substitute.

PREVENTION

The overwhelming majority of cases of watery diarrhea can be avoided by taking certain precautions, specifically clean water and sanitation, hand washing and proper food care, and getting vaccinated .

Sanitation

Most germs that cause watery diarrhea are spread through contaminated food and water, often because of unsanitary conditions or practices, the best

ways to prevent infections that cause watery diarrhea are drinking clean and filtered water, washing your hands after using the bathroom, and washing your hands before eating.

Safe Food Practices Some infections that cause watery diarrhea are caused by food that hasn't been prepared properly. Be sure to wash your hands before preparing food, keep fresh produce away from raw meats, and cook meats thoroughly. In addition, store prepared foods at proper temperatures and out of reach of pests such as house flies .

Vaccination Rotavirus vaccination is part of the routine childhood vaccination schedule recommended by the U.S. Centers for Disease Control and Prevention [33]. It's given orally in two or three doses (depending on the brand), beginning at 2 months of age. While the vaccine is recommended by pediatricians, it's rarely required for childcare enrollment. Perhaps as a result, vaccination rates for the rotavirus vaccine in the United States frequently lag behind rates of other vaccines given at the same age. For example, only about 73% of kids who are 19 to 35 months old had been vaccinated against rotavirus in 2017, compared to 91.5% who had been vaccinated against measles [34].

Cholera Vaccine :-the U.S. Food and Drug Administration approved a cholera vaccine in 2016, but it is currently only recommended for adults (18 to 64 years old) who are planning to travel to places where cholera is common or there are active outbreaks [35], the vaccine is given in a single dose and has been shown to lower the chances of getting severe diarrhea in adults by 80 to 90%.

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