

Diet in diseases of the pancreas and gallbladder

Gallbladder diet

The diet in gallbladder diseases is very similar to the diet in pancreatic and hepatic diseases. It is typical for this group of diseases that dietary treatment has played a crucial role in the past. Today it is typical that dietary treatment has some significance in prevention and only limited symptomatic significance - in relief from pain. Diets have lost their importance in the treatment.

Bile is stored and thickened in the gallbladder. The main function of bile is fat emulsification, which allows the action of the digestive enzymes. Bile also has an excretory function (it eliminates harmful substances from the body). Many substances pass through the so-called enterohepatic circulation, meaning the substances return to the body after reabsorption from the intestine.

Gallstones (cholelithiasis) is a very common disease. It occurs both in relative malnutrition in developing countries (up to 70%) and in developed countries with excessive food intake (30-60% of adults in Europe). It is more common in women, probably due to estrogen. Other risk factors include obesity, long-term parenteral nutrition, and constipation. That is probably due to the effect of deoxycholate produced by intestinal bacteria. The influence of the BMI and waist circumference is more visible at a younger age. The protective effect of vegetables and fiber has only been demonstrated in some studies. Alcohol consumption probably slightly protects against gallstones (cholelithiasis) and higher cholesterol intake does not have a significant impact on the development of cholelithiasis in humans. Intake of sugar, starch, and potatoes probably increases the risk of developing cholelithiasis. In diagnosed cholelithiasis, a diet with general fat restriction is appropriate. A sufficient amount of quality fat-free protein and relatively more carbohydrates should be taken before surgery. More or less, there is no evidence that a fat-restricted diet plays a role in already existing cholelithiasis. Rather, gradual mild weight reduction and a healthy, balanced diet, without any deficiency diseases preoperatively are appropriate. Children with gallstones have small fat and protein reserves and tend to have malnutrition.

The daily bile production is about 1000 ml and the gallbladder contains about 70 ml of bile that is concentrated 10-20 times. Normally, bile is excreted within 5-20 minutes after a meal. The **regularity of intake** (e.g. 5 times a day) and the **food restriction 2-3 hours before going to bed** are recommended in the prevention against gallstones. It is advised to chew all bites well while eating and to eat in a good mental state without any stress.

A special **diet** is recommended **after biliary colic**, which helps the movement of the gallstone to pass through the biliary tract. Acute colic requires **plenty of fluids**. Suitable is tea, crackers, cooked fruit, cooked rice during the next days, pasta, carbohydrate (sugar) diet. We serve protein first in bread, potatoes, and plant foods. Later on, skimmed milk, yogurts, cottage cheese, and lean meat could be served. For quite a long period of time fats, such as butter, should be excluded from the diet. Even cheese should not be served at first. Grain and flour products are the main components of the diet. We exclude spices and eggs from the diet, too. We recommend cooked and stewed meat, rice mash, milk diluted in water, mashed potatoes without fat, leafy vegetables, or carrots.

Prof. Páv showed that a **diet with a prevalent amount of gallbladder-type carbohydrates** did not require a reduction or increase of the dose of insulin in diabetes patients in the 1980s. The most common mistake in clinical practice is reducing insulin dose in the belief that the intake of carbohydrates is more complex and at the same time the amount of food intake is smaller in general. The dose of insulin may sometimes need to be slightly increased because of ongoing inflammation.

A more varied diet is possible when suffering from **chronic gallbladder disease**. This diet is very individual and depends on the tolerance of specific meals in a particular individual. Most patients do not eat fatty meats, spreads rich in fats, creams, and mayonnaise salads. The fat that is contained in the dough is more suitable. Carefully, butter or vegetable fats can be added to the diet with a maximum of 30 g/day. Sour dairy products are tolerated better, as are sweet foods, cottage cheese, and non-aromatic cheese with up to 30% of fat. Fats should only be raw, not burnt. Eating only egg whites, veal, fish, and lean beef. Pork, tendons, and intestines are unsuitable for the diet. Pastries rather older and unleavened. The greatest variability is in the tolerance of vegetables. Carrots, cauliflower, asparagus, spinach are usually well tolerated. Fruits that are well tolerated are, especially, apples, apricots, peaches, and tangerines, while on the other hand garlic and onions are not tolerated well. **In the acute stages of gallbladder inflammation** (cholecystitis) we serve a tea diet, eventually tea and biscuits. After that, we can switch to a gallbladder No. 4 diet for 2-3 days, resp. strictly saving with the exclusion of free fat.

Rules of the saving strict gallbladder diets

(also noted as 4S)

- This diet is not energetically and biologically complete, and therefore following the diet for a long time is not possible.
- The diet is mostly carbohydrates. Meat and dairy proteins are completely excluded.
- The level of protein intake is up to 30 g/day and is covered mainly by vegetable proteins.
- Fats in the diet are below 20 g/day. Using free fats for greasing pans and in food preparation is prohibited.
- The content of vitamins and minerals is not complete because only certain types of food are permitted. It is usually not necessary to follow a strict diet for a long period of time.

Technological preparation of meals for the 4S diet

It is as gentle as possible. The meal should be cooked gently. First, everything should be served in a form of mush. Pans should not be greased.

| Examples of the strict gallbladder diet (all dishes are non-greasy!) | | | |
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| Breakfast | tea, biscuits | | |
| Lunch | flake soup, mashed potatoes, fruit snack | | |
| Snack | banana | | |
| Dinner | risotto with carrots, apricot puree | | |
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| Breakfast | tea, aged white bread, jam | | |
| Lunch | mashed potato soup, non-greasy stewed carrots, pressed potatoes | | |
| Snack | grated apple | | |
| Dinner | fruit pudding with biscuits (pudding cooked with sliced peach compote) | | |
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| Breakfast | tea, aged white pastry, honey | | |
| Lunch | rice soup with carrots, vegetable sauce (mixed boiled carrots with celery and parsley thickened with flour, flavored with lemon juice, sugar and salt), pasta | | |
| Snack | fruit snack | | |
| Dinner | pudding with apples and buns (baked sliced sweet white bread with apples, slightly sweetened) | | |

After an acute period of the disease (biliary colic or gallbladder inflammation) there is a **transitional period with a subsequent adjustment to the diet**: after 2-3 days of the strict 4S diet, other foods are gradually being added - egg whites, non-fat dairy products (cottage cheese, melted cheese and cheese sliced with up to 30% fat, yoghurts with up to 2% fat), cooked lean meat (chicken breasts, fish fillets, lean beef, rabbits). This diet is very individual and the cooperation of the dietitian with the patient is necessary to eliminate foods that are causing problems. The diet is still non-greasy with the exclusion of free fats. After this period, we switch to the usual gallbladder saving diet in hospitals, usually referred to as No. 4 diet. We administer it in chronic inflammation of the gallbladder, when gallstones present, after the end of acute problems, and also after removal of the gallbladder (cholecystectomy).

Gallbladder Diet Rules No. 4

- The diet has a saving character both by choosing foods and the method of preparation.
- By choosing low-fat foods and a limited amount of free fat for greasing and food preparation, we reduce the total amount of fat to 60 g/day. Frying is not permitted.
- Individual food selection will prevent the patient's subjective difficulties from getting worse.
- We provide a rich diet with plenty of vitamins and minerals.

Technological preparation of dishes for gallbladder diet No. 4

We strive to make a varied menu. The meat should be stewed, cooked., or it is also suitable to prepare it in the microwave oven. For better taste and colour, the meat could be fried without using fats for greasing. After that water could be added for further cooking and preparing the meat. We do not use onion as a base or oil for frying. We do not thicken sauces with a roux, but with flour or with flour mixed with water. We do not fry meals, nor grilling is it suitable. Also, frying meat juices is not suitable, because these methods of preparation burn fat and produce irritant substances. The permitted amount of fat (butter or quality oil), which is 10 g per portion, can be added to the already prepared meals.

| Examples of the gallbladder diet | | | |
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| Breakfast | tea with lemon, white bread, yoghurt white coffee, white bread, 10 g of butter, 30% melted cheese mint tea, white bread, 50 g of ham tea with milk, sponge cake with apricots green tea, low-fat yoghurt with cornflakes | | |
| Lunch | low fat broth with noodles, chicken breast with cheese baked in foil, mashed potatoes, compote flake soup, beef stew, steamed rice, carrot salad vegetable soup containing source of protein, dietary roast meat (without garlic and onion), potatoes, lettuce with lemon low fat broth with rice, boiled beef, diet tomato sauce, pasta bun soup, stewed carp on cumin, potatoes with chives, peeled tomato without grains | | |
| Snack | tea, sweet pastry, fruit jelly, fruit puree, grated apples, peeled peach | | |
| Dinner | cheese spread with ham, white bread, peeled tomato veal stew, mashed potatoes rice pudding with apricots baked pasta with meat and parsley, compote boiled lean pork, stewed carrots, potatoes | | |

Pancreas - diseases and diets

Acute inflammation of the pancreas (acute pancreatitis) is a life-threatening disease that requires full parenteral nutrition. The state of the internal environment is adjusted by the application of infusions. Unlike in the past, nowadays fat emulsion is a part of the parenteral nutrition early. Concerning the ongoing inflammation, it is necessary to cover the need for energy and also cover protein intake. After acute pancreatitis, first fluids can be applied per os, then enteral nutrition with defined preparations is administered. Fat can be added later to prevent the long-term stimulating secretion of stomach acid - coffee and tea.

Chronic pancreatitis primarily requires a good substitution of pancreatic enzymes. A relatively loose diet is usually tolerated; in case of insufficient enzyme substitution, patient can develop malabsorption of fat and proteins, protein malnutrition, hypocalcemia, and deficiency of vitamin D and other fat-soluble vitamins.

Cystic fibrosis is the biggest nutritional problem because ongoing inflammation (e.g. lung infections) increases energy requirements. It is necessary to control the nutritional status and careful substitution of pancreatic enzymes, as well as identified deficiencies of ions, vitamins, and nutrients.

In **chronic diseases of the pancreas**, the diet should consist of proteins (15-20%), less fats (35-40%), and carbohydrates (35-50%). In the past, diets with absolute fat restriction were administered. Today, given the high quality of enzymatic preparations, fat in the diet is acceptable. We also serve more disaccharides and polysaccharides, after which, however, significant flatulence could sometimes develop. Oils and medium-chain fatty acids (MCT C8-C10 fats) are suitable, but can sometimes cause abdominal pain and diarrhea because of relatively higher osmolality. Then the individual solution to this intolerance should be sought. The claim that omega-3 fatty acids reduce the inflammation present in pancreatitis and cholelithiasis by decreasing leukotrienes is controversial and neither has been sufficiently proven in chronic inflammation. Sipping is suitable in the early stages. Especially in the case of weight loss. The use of a nasogastric tube is very suitable for anorexia or inability to eat. Malnutrition is a risk factor for pancreatitis exacerbations. Previously, in acute pancreatitis, parenteral nutrition was given for 4-7 days, then oral intake with reduced-fat was started slowly. Today, there is a study confirming that normal nutrition is beneficial from the beginning, even with the administration of a small amount of fat. Alcohol must be excluded from the diet almost permanently in pancreatitis. Dietary tables and diets for chronic pancreatitis are practically the same as for the gallbladder disease.

More severe malnutrition, loss of fat reserves, and muscle mass occur mainly in **chronic pancreatitis**. It happens due to a maldigestion (indigestion), event. diarrhea characterized by an increased fat content (steatorrhea), but also due to pain that causes the patient to be afraid of food. Another reason may be undiagnosed diabetes or hidden alcohol abuse.

The absolute prohibition of alcohol intake is the No. 1 dietary intervention. Energy intake is regulated by individual needs and is usually spontaneously adjusted by the patient depending on their ability to consume food. Setting of the daily meal regimen is important because it is necessary for the patient to eat in smaller doses and more often, meaning 6-7 times a day in 2.5-3 hour intervals. The meals should be easily digestible. This term is often misused but it means that it is a chemically and mechanically saving diet. Burnt fats are prohibited and fresh fats should cover a maximum of 25% of the energy content of the diet. It is also possible to add medium-chain fats (MC fats) that are easily absorbed in fluids, eventually by themselves. However, this is not a common practice due to possible complications, the price of these nutrients, and, last but not least, due to taste characteristics. Foods containing high amounts of hidden fats, such as fatty meats, smoked meats, cheese, but also nuts, are also

unsuitable. **Protein intake** is very important to prevent protein deficiency. The desired level of protein intake should be 1-1.5 g/kg of body weight. The rest of the percentage consists of carbohydrates, which are generally better tolerated in foods with a lower glycemic index and whose intake is evenly distributed throughout the day. Mono- and disaccharides are not prohibited either, but it is advisable to take them in reduced amounts, especially in patients suffering from secondary diabetes mellitus is present. It is not necessary to emphasize the need for fiber supply. It occurs spontaneously by consuming fruits and vegetables according to the individual tolerance of the patient. Generally, flatulent vegetables such as onions, garlic, peppers, etc., as well as foods with hard indigestible fibers such as legumes and whole grains are poorly tolerated. It is necessary to maintain sufficient **fluid** intake in between meals, meaning at least 1.5 l/day - if no other complications are present. Strong tea, coffee, and spicy food seasoning should not be a part of the diet because they increase the acidity of the stomach.

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