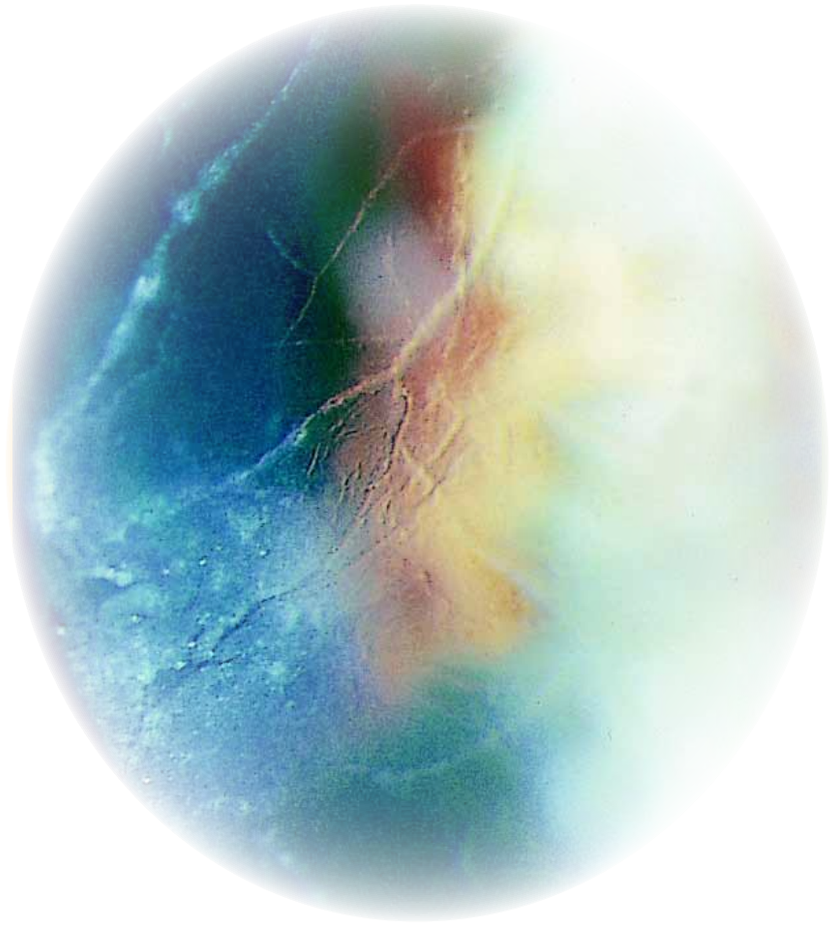

Meretoja disease

Guide for patients, their family and nursing staff

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Cover: Meretoja disease causes lattice-like degeneration (CLD = corneal lattice dystrophy) on the patient's cornea. From K.M. Saari, ed. Silmätautioppi, 6th edition.
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FOREWORD

The purpose of this guide is to give information about Meretoja disease, its symptoms and treatment for patients, their relatives and nursing staff. Because the disease is rare, it is not very well known among patients or nursing staff, and there has previously been no guide available. We hope this guide will be helpful for everyone interested in Meretoja disease!

The contents of this guide have been widely collected from different researchers and studies. In the end you will find information where to find more information about the disease and life with it. The guide is our thesis for nursing studies in the Diaconia University of Applied Sciences. The guide has been made in cooperation with The Finnish Amyloidosis Association.

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WHAT IS MERETOJA DISEASE?

Meretoja disease, also known as hereditary gelsolin amyloidosis, advances with age. Typically it manifests itself with eye, nerve and skin symptoms. A Finnish eye specialist Dr. Jouko Meretoja discovered the disease in 1969. The disease is one of the approximately 40 hereditary diseases particular in Finland, where there are circa 1000 patients. The disease is amyloidosis inherited autosomally, meaning it is independent of sex. If the child gets the gene defect from one of his or her parents, he or she will get the illness.

The disease is originally more frequent in Häme and Kymi regions, but now some cases have been reported in Europe, North America and Asia as well. The disease is also known as familial amyloidosis, Finnish type (FAF), familial amyloid polyneuropathy type IV, amyloidosis V and corneal lattice dystrophy (CLD) type II.

WHAT CAUSES THE DISEASE?

Meretoja disease is a hereditary metabolic disease caused by abnormal gelsolin protein. Normally this protein exists in cells, in different tissues and in blood. In Meretoja disease, the gelsolin gene defect leads to a flaw in gelsolin. The protein's normal degrading in system is disturbed, and the abnormal gelsolin particles start to produce non-soluble amyloid. This gelsolin amyloid accumulates mainly inside arteries, outside cells and basement membranes of several organs causing the symptoms of Meretoja disease.

If a person has Meretoja disease, the risk for his or her child to carry the disease is 50%. If the child does not carry the gene defect, he/she, as well as his/her children, do not get the disease. If the gene defect comes from both parents, the disease will be more difficult, and every child of such parents will suffer from the disease.

HOW THE DISEASE IS DIAGNOSED?

Meretoja disease runs in families and it is often known among the family. This means that those who may possibly carry the disease know the nature of the disease already.

The clinical diagnosis is based on corneal dystrophy, or CLD finding in biomicroscopic examination performed by an eye specialist. This is typical for Meretoja disease and separates it from other diseases. The neurological symptoms rarely come first. The accumulation of amyloid can be demonstrated either with a skin or muscle biopsy or with aspiration of subcutaneous fat. Finnish research has shown the cause of Meretoja disease to be the mutation of gelsolin gene G654A.

If you suspect some health problem to be caused by Meretoja disease, contact a health centre or your occupational health care. Your doctor will help you plan the necessary examinations according to the symptoms you have had. You should also inform the doctor if the disease is hereditary in your family. This preliminary knowledge will help the doctor to form the diagnosis and plan the necessary treatment.

If you have inherited the gene defect, the Meretoja disease appears at some point. It is possible that someone who has the risk to have the disease would want to know the situation before the first symptoms. This is called preliminary genetic testing. The qualification for the testing is that the family's gene defect is known. If you wish to have these tests taken, you must visit genetic counselling at a university hospital for a discussion and evaluation if the samples must be taken. For this you will need a referral from your personal doctor. A blood sample will show if you carry the family's gene defect. If you do, the specific symptoms or the age of falling ill, however, cannot be told. The preliminary genetic tests are only done for those adults and maturating who have the risk. The knowledge of the gene defect may be important especially when planning a family. The genetic tests can also be done to the foetus in the beginning of pregnancy.

The examinations for finding out the possible disease are taken in the public sector health care with a dispensary cost. Genetic counselling and the possible genetic tests are also included in the dispensary cost, if you have received a financial obligation from your home city. If you go to a private doctor, you may apply for reimbursement from Kela, the Social Insurance Institution of Finland.

THE SYMPTOMS

The Meretoja disease causes eye, neurological, skin and oral symptoms that often increase over the years. First symptoms appear when the patient is in his/her twenties. Most of the patients, however, are quite healthy even when they are 60 to 70 years of age. Typical symptoms are eye symptoms, itching and dryness of the skin, numbness and tingling of fingertips and toes and symptoms of the mouth. Other symptoms and findings, such as arrythmia and proteinuria, occur rarely.

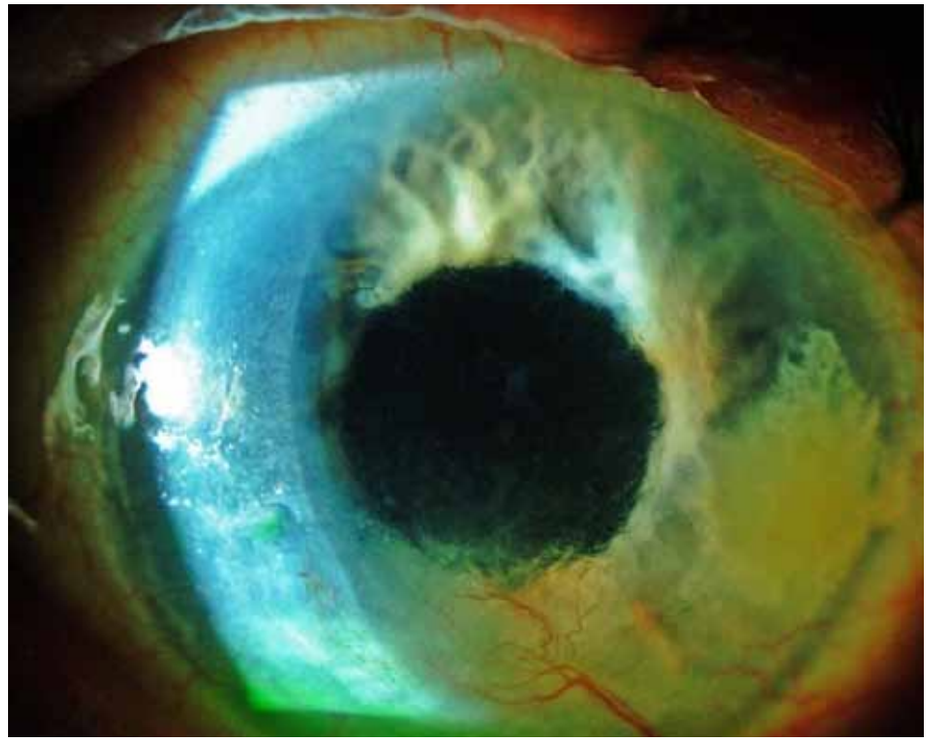
Eye symptoms

The first symptoms of Meretoja disease are often eye symptoms. The symptoms make the patients to seek help from an optician or a doctor who often make a Meretoja disease diagnosis. The disease causes a net-like degeneration on the cornea, causing gradual sight loss, dryness, itching and irritation of the eye, as well as infections and sensitivity of sunlight and dust.

The most common eye symptom is dryness which occurs in patients of all ages. Because the cornea has lost its sensation, the patient does not always feel the dryness and the use of eye drops may be rare. When the lower eyelid turns outwards, the eye dries even more because the eye vaporises more tears when the opening between the eyelids is wider. Glaucoma and cataract are more common in patients over 60.

Cataract causes the lens to opaque and prevents light from getting to the retina leading to sight loss. Especially night blindness is common in cataract because the eye cannot distinguish contrasts. The opacity of the lens affects the breaking of light and causes sensitivity to light.

Glaucoma or ocular hypertension is an illness which may damage the optic nerves, the optic nerve head and field of vision. The disease is found when a doctor examines the eye pressure, the optic nerve head, the optic nerve layer, field of vision and the angle of the eye chamber.



The net-like degeneration (corneal lattice dystrophy CLD II) in an eye of a patient suffering from Meretoja disease can be seen as pale strand formations. Biomicroscope photo: Seppo Lemberg, HYKS Eye Clinic. Kiuru-Enari S. and Haltia M. Duodecim 2010, 126:1162-71.

Neurological symptoms

Neurological problems often start when the patient is around 40. The symptoms typically occur as a slowly progressing neuropathy (dysfunction of the nerve) of the facial nerve. The function of the nerve is to take care of the movements of the facial muscles as well as expressions. Neuropathy usually starts at the highest parts of the nerve and later spreads to the lower branches. The first sign can be the difficulty to frown. The eyelids will gradually start to droop and later hinder sight.

When progressing, the symptoms may make smiling and swallowing more difficult. Some patients may suffer from the atrophy of tongue due to the dysfunction of the hypoglossal nerve. Voice may also begin to slur.

The symptoms increase slowly with age. Other symptoms of the cranial nervs, such as myokymia or decline in hearing which

is caused by the insufficiency of the auditory nerve, may also later occur. Symptoms of the peripherial nervous system, such as numbness and tingling of fingers and toes, are usually mild. Some symptoms of the peripherial nervous system may occur in wrists as a carpal tunnel syndrome, which means the numbness, muscular weakness and pain in the area of the thumb, index and middle finger.

Patients over 70 years of age may have difficulties in balance and walking, muscular weakness in arms and legs, as well as dysfunction of the autonomic nervous system such as decreased sweating, low blood pressure, dizziness and constipation. Meretoja disease does not cause dementia.

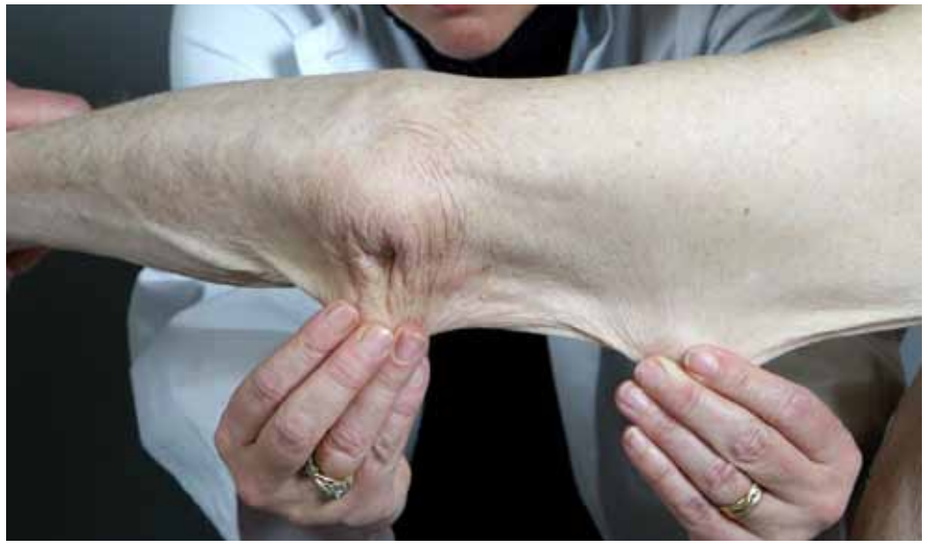
Skin symptoms

Skin symptoms caused by Meretoja disease begin when the patient is around 50 years of age. The skin dries easily, is itchy and more easily bruised, nicked or wounded even from small injuries.

Cutis laxa, or abnormal looseness of the skin, is very typical for Meretoja disease.

The skin loosens around the patient's face, scalp, back, elbows, knees and hands. The looseness of the face and hanging skin changes the patient's appearance and affect his/her expressions.

The loose skin in this 67-year-old patient's arm is caused by Meretoja disease. Source: Kiuru-Enari Sari, Helsinki University Central Hospital, Neurological Clinic



The patient's facial features also age prematurely. Because these changes can easily be noticed and the symptoms are similar between patients, older patients suffering from Meretoja disease resemble each other. Cutis laxa can also cause restricted vision as well as difficulties in speech and eating which severely hinder the patient's life.

Dental and oral symptoms

Different oral and dental problems are a part of Meretoja disease. Dryness of the mouth is common and easily causes infections and unpleasant feeling in the mouth. Dryness is caused by the hanging lower lip which makes the saliva to dry more quickly. Declining salivation caused by the atrophy of the salivary glands also increases dryness. The symptoms are metallic taste in the mouth and atypical cavities. Increased amounts of amyloid and infections as well as more candida have been found in the patient's saliva samples. Declining salivation predisposes to candidosis which symptoms are red and sore tongue and mucosal membranes and sometimes white deposit in the mouth. The infection may also occur under a denture because that is a favourable place for a candidosis. If you suspect a candidosis, you should see your dentist.

TREATMENT

Meretoja disease has no cure, but the symptoms are treated as they occur.

Eye treatment

Regular and constant daily care of the eye symptoms has a great impact on the patient's quality of life and maintaining the clearness of the cornea. It is recommended to use close-fitting protective glasses outdoors, and sometimes the plastic surgery of the outward turned lower eyelid is necessary. Moistening the eyes, protecting them from wind, dust and dazzle and cleaning them to prevent infections are very important.

For moistening, use individually packed eye drops without ad-

ditives. Sometimes the treatment may be corneal transplant.

For cataract, the only treatment is surgery. If eyesight is failing, the patient should visit a doctor who may direct him/her to a specialist. The surgery is often performed with ultra sound, which lessens the size of the wound and quickens the healing.

The most important thing in treating glaucoma is to decrease the pressure in the eye. This can be done with medication, laser treatment or surgery. Decreasing the pressure may prevent damage in the anatomy and functioning of the eye.

Most patients benefit from regular follow-ups with an eye specialist who can notice problems in the cornea and the possibility of developing glaucoma.

Facial surgery and treatment of nervous symptoms

Patiets suffering from Meretoja in Finland disease belong to public health care when it comes to functional symptoms of the face. This means that the patients may receive a referral to a plastic surgeon from their personal doctor. The plastic surgeon will then evaluate the need and date of the surgery. Because the disease is progressive, the patient may need several surgeries, and sometimes it is best to wait the symptoms to progress before starting the surgery. The patient may have several different remedial operations, such as uplift of eyebrows or forehead, repair of the eyelids, facelift, and different lifts supporting the eyelids and the mouth. After the surgery, typical problems are dryness in the mouth, haematomas and swelling. It is important that the performing surgeon knows about the disease and takes it into account in his/her decision of treatment. Healing of the tissue is usually not a problem.

The neurological symptoms cannot be prevented but a neurologist may help treating the symptoms. If the patient often loses his/her consciousness, it is important to remember that the disease may also cause arrythmia. In these cases, a heart specialist may often help. For many patients, the symptoms of carpal tunnel syndrome, such as numbness and weakness of hands, can be eased by surgery. To ease the neurological symptoms, vitamin B and magnesium can be used.

Before the surgery, the operating staff should be aware of the patient's Meretoja disease and take it into consideration, because the patient's tissue is usually more fragile and he/she may more easily get haematomas.

Treatment of the skin

The most effective treatment for dry and itchy skin is oiling. The patient does not need to avoid washing, for showering, bathing and swimming help the skin to restore its moisture levels to normal.

After showering, bathing or swimming, the skin must be oiled as thoroughly as possible so as to bind the water in the skin. You can choose the lotion after your liking. Some lotions increase the moisture to evaporate and may dry the skin even more. Ask about the differences from your pharmacist. Sunlight and light treatment may ease the symptoms. In the summertime, you can enjoy the benefits of UV radiation even in the shade. The operative treatment for skin problems may be the lifting of face, forehead and eyelids.

Treatment of mouth and teeth

The most important thing is to take care of the dry mouth. If your mouth is dry, let a dentist measure your salivation. Decreased salivation significantly increases the risk of caries.

To prevent caries, the most important thing is regular dental care in addition to regular dentist appointments. Careful dental care includes brushing twice a day and flossing daily. The toothbrush must be soft in order to prevent erosion in the neck of tooth. An electric toothbrush removes plaque more efficiently and a smaller tip goes more easily to difficult corners. There are different kinds of toothbrushes and other dental cleaning equipment available for different hand motor functions.

Choose fluoridated, non-foaming toothpaste because foaming substances is irritating to tissues for many. You may enhance cleaning with mouthwash which must be fluoridated and non-alcoholic, because alcohol causes dryness. Clean dentures twice a day and always rinse them after a meal. Use effervescent (fizzy) denture cleaner once a week or a month, or when needed. Caries may also be prevented with xylitol chewing gum or fluorine tablets you can purchase from the pharmacy.

A dry mouth is an irritating problem, even if salivation has not decreased. Salivary glands can be made to produce more saliva by increased chewing or adding more wholemeal bread or raw vegetables to the diet. Chewing gum with xylitol may have the same effect but this must be used within reason for it may act as a laxative. Liquids, preferably milk and water, should be drunk enough (1 to 1,5 litres) per day. Sweet juices and coffee should be avoided. Many non-sugary drinks are sour and therefore not suitable as thirst-quenchers.

Dry mouth may also be a side effect of several medications. Ask your doctor if there is an alternative for the particular medicine. Pharmacies sell pastilles to care a dry mouth, but for some patients these are no help. Mouth sprays are also available in the pharmacy, but you can also use normal cooking or olive oil to ease the dryness. Brush the oil with your finger on the mucous membrane and especially to the insides of your cheeks and lips. Pharmacies also have several products intended for dry mouth available, you can try and find the most suitable one for you.

LIFE WITH MERETOJA DISEASE

The degree of difficulty of Meretoja disease has an essential effect on how much it hinders everyday life. Mild symptoms do not necessarily harm daily life very much, but advanced symptoms may cause more problems. It is important to recognise the handicaps of one's illness and adapt your everyday life with them. You should

For mouth and dental care

Tooth pastes: Salutem, Biotène, BioXtra, Yotuel
Mouth rinses: Biotène, BioXtra.
Chlorhexidine mouth rinse Paroex

Fluoridated pastilles 6 pcs/day
Fluoridated mouth rinses (Meridol, Elmex)

maintain a good constitution, but excessive emotional and physical exercise must be avoided. Listen to your own body and do what feels good.

The biggest practical difficulties are eyes, skin and mouth problems. These are however possible to relieve with different treatments. It is important to notice that although Meretoja disease may hinder i.e. practising some hobby, it is no hindrance to a full and rich life. The disease has no effect on fertility or any negative impact on having children. It does not effect education, career or financial situation.

If you have Meretoja disease in your immediate family, you could prepare for it yourself because of its vast hereditary nature. The first symptoms appear in adulthood so along with public health care, occupational health care has an important role in finding the disease and treating the symptoms. The Finnish Amyloidosis Association connects patients with Meretoja disease. Through them you may have new contacts, hear other experiences and get support from people with the same disease. Because the disease progresses slowly, the patient has several years of rich life ahead.

FINNISH AMYLOIDOSIS ASSOCIATION

The Finnish Amyloidosis Association SAMY is an association for patients. The aim of the association is to pass on information and to help the patients to reach different treatments and rehabilitation possibilities. The association supports and promotes research about the disease by offering the patient network for the researchers.

People suffering from Meretoja disease can join the association with a written application or sending an email to the address found on the association's webpages.

Contact information:
Suomen Amyloidoosiyhdistys ry:
c/o Suomen Potilasliitto ry
Helsinginkatu 14 A 1, 00500 Helsinki
Phone: 045 8774 411 (on Fridays from 10 to 12 a.m.)
www.suomenamyloidoosiyhdistys.fi
samy@suomenamyloidoosiyhdistys.fi

USEFUL LINKS

Social Insurance Institution of Finland, Kela : ***www.kela.fi***
Finnish Federation of the Visually Impaired (FFVI): ***www.nkl.fi***
The Finnish Association of People with Physical Disabilities: ***www.invalidiliitto.fi***
Rights of Patients: ***www.valvira.fi***
Finnish Patient Insurance Centre: ***www.pvk.fi***
Tax deduction due to the reduction of tax-paying ability: ***www.vero.fi***
Pension security: ***www.kela.fi, www.etk.fi, www.tela.fi***
Access to treatment: ***www.stm.fi, www.kunnat.fi***
Genetic counselling: ***www.vaestoliitto.fi***

Genetics clinics:
Hospital District of Helsinki and Uusimaa (HUS) 09-4717 2189
Kuopio University Hospital (KYS) 017-1721 48
Oulu University Hospital (OYS) 08-3153 218
Tampere University Hospital (TAYS) 03-3116 5507
Turku University Hospital (TYKS) 02-3131 39012 13

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Suomen Amyloidoosiyhdistys ry

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