Crohn's disease

- Crohn's disease (colitis regionalis, terminal ileitis) is a chronic inflammatory íntestinal disease
- inflammation occurs in any part of the digestive tract and has a segmental character
  - there are sections of healthy mucosa between the affected areas
- the most commonly affected area is the terminal ileum
- inflammation affects the entire wall thickness of the organ and is characterized by the presence of non-caseifying epithelioid granulomas
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Epidemiology

- Crohn's disease is more common in younger people
- the highest prevalence is in the group of 30-39 years. 10% of patients are diagnosed before the age of 17
  - the average prevalence in adults is about 130 / 100,000, the incidence is 5.6 / 100,000 inhabitants;
  - the incidence in children is on the rise, reaching up to 9-10 / 100,000, especially in northern Europe
  - the incidence in children in the Czech Republic is 6.2 / 100,000

Risk factors

- Grade 1 relatives have a 10-35-fold higher risk of disease.
- Genetic mutations.
- High hygienic standards in childhood, smoking, early appendectomy, and non-steroidal anti-inflammatory drugs.

Ethiopathogenesis

- The cause of the disease is not yet known
- This is probably a dysregulation of the immune response to common bacterial antigens
- During the autoimmune reaction, transmural inflammation occurs, that affects the entire wall of the intestine, which often passes to the mesentery.
- Epithelioid granulomas, ulcerations, and fissures form in the intestinal wall.
- We often see intramural and intraperitoneal abscesses or fistulas (especially in the anal area).
- Due to long-term inflammation, the bowel may narrow by scarring of the tissue (scar stricture).
- Crohn's disease is characterized by segmental GIT involvement → alternating inflammatory and unaffected sections ("skip lesions").
- Predilection areas include the terminal ileum and ascending colon, but any part of the GIT can be affected.

Pathological picture

- The entire intestinal wall is affected and the inflammation is segmental or plurisegmental.
- Typically, the affected sections alternate with the unaffected sections (unlike ulcerative colitis).

Macroscopic image

- Macroscopically, we see thickening of the intestinal wall and mesentery. Regional lymph nodes are often enlarged.
- The mucosa is hypertrophic and edematous.
- The image is often compared to cobblestones - elongated aphthous ulcers above the lymphatic follicles surrounding the unaffected mucosa, swollen fistula mouths, pseudopolyps.
- Affected serosis leads to adhesions in which fistulas form. In the further course of the disease, fiber production follows, which leads to stenoses.

Microscopic image

- In the microscope we see mucosal edema with polymorphonuclear infiltration, followed by fiber production with the formation of tuberculoid granulomas (epithelioid cells and giant Langhans-type cells, unlike TB, do not caseify) in the submucosa, subserous, and regional nodes.

Clinical picture

- Like all autoimmune diseases, Crohn's disease manifests itself in multiple systems.

- The typical manifestation is in the digestive tract, but the eyes, skin and mucous membranes, liver, pancreas, kidneys are also affected, and blood homeostasis is often disturbed.

Intestinal manifestations

- Common symptoms include abdominal pain and chronic diarrhea (rarely with blood).

- Fissures, perianal abscesses, fistulas, and mariske (anal lashes - skin growths in the area of the anus and skin transition) may occur around the rectum.

Extraintestinal manifestation

- Extraintestinal symptoms occur in more than 40% of patients.
- It often precedes intestinal manifestations by up to several years.
- These are mostly non-specific symptoms such as recurrent fevers, anorexia, weight loss, and growth retardation, especially in children.
- The main systems that tend to be affected include:

1. skeleton: growth failure and osteoporosis (proinflammatory cytokines suppress growth, suppress IGF-1 production, stimulate bone resorption; insufficient energy intake, malabsorption, loss of protein and trace elements in the stool, chronic treatment with corticosteroids)
2. skin and mucous membranes: aphthous stomatitis, gingivitis, granulomatosis cheilitis, erythema nodosum on the lower legs, and purulent pyoderma
3. eyes: iritis, uveitis, episcleritis; rare in children; corticoid therapy can cause cataracts and glaucoma
4. liver and pancreas: primary sclerosing cholangitis, cholecystolithiasis; pancreatitis after azathioprine or mesalazine therapy
5. vascular system: hypercoagulable state (thrombocytosis, increased fibrin, factor V and VII, decreased antithrombin), which may cause deep vein thrombosis, pulmonary embolism or CMP
6. kidneys and urinary tract: fistulas, urinary stones.

Complication

- Inflammation often spreads to the surrounding area and forms fistulas (ie, canals connecting the sites of inflammation to any other site).
- Fistulas can be:

1. internal: enteroenteric, enterocolic, enterovesical, rectovaginal
2. external (perineal abdominal wall)
3. Other complications include
    - formation of abscesses, which may be intercostal, pelvic, retroperitoneal, hepatic
    - intestinal stenosis, which is dangerous due to the impending ileus
    - perianal fissures
    - intestinal perforation and its complications: peritonitis
    - massive bleeding
    - toxic megacolon
    - reversal in cancer

Diagnostics

- Diagnosis of the disease is classically based on anamnesis, physical examination, laboratory, and imaging methods.
- Patients' medical history often includes abdominal pain, chronic diarrhea, growth retardation (may precede GIT manifestations), and recurrent fever.
- During the physical examination, we find typical skin changes, mucous membranes, rectal and genital areas (fistulas, mariskas) and we may feel abdominal resistance.

Laboratory diagnostics

1. Markers of acute and chronic inflammation: CRP, FW, albumin level, blood count - anemia, leukocytosis, thrombocytosis.
2. Antibodies to Saccharomyces cerevisiae (ASCA) are positive in more than 50% of patients.
3. Parameters of liver, kidney, pancreas function - the risk of involvement of these organs.
4. Calprotectin in stool - an indicator of mucositis (leukocyte cytosolic protein, which is released from leukocytes after their activation or lysis).
5. Occult bleeding in the stool.

Imaging methods

1. Ultrasound - thickening of the intestinal wall and abdominal abscess.
2. Enterography using MR, MR examination of the pelvic floor.
3. Previously enterography (enteroclysis; under X-ray control, a barium suspension was applied to the duodenum and then a methylcellulose solution).
4. Irigography (X-ray examination of the colon after infusion of the contrast agent with the rectum) - when an endoscopic examination is not possible.
5. Fistulography (injection of a fistula with a contrast agent under X-ray control).
6. CT - diagnosis abdominal abscesses.

Endoscopic examination

- Colonoscopy - allows macro-and microscopic examination of the mucosa (aphthoid lesions, ulceration, squamous relief, strictures); in children under general anesthesia.

- Gastroscopy.
- Capsule endoscopy (miniature digital camera in a plastic capsule 11 x 26 mm) - allows you to examine the small intestine (the section between the gastroscope and the colonoscope); can be used from about 6 years of age, in young children it is introduced into the duodenum by gastroscope.

Therapy

1. Drug therapy
    - corticosteroids - to initiate therapy in acute inflammation; induces remission in about 85% of patients;
        - systemically Prednisone 1-2 mg / kg / day (maximum 60 mg / day) for 2-4 weeks, followed by gradual reduction;
        - or topically active budesonide - less effective, fewer side effects;
    - Immunomodulatory drugs - to maintain remission without corticosteroid administration
        - thiopurines - the need to monitor blood counts, liver function tests, and amylase; risk of allergic reaction;
        - methotrexate
        - antibiotics (ciprofloxacin, metronidazole)
        - 5-aminosalicylates (sulfasalazine, mesalazine) - act more in ulcerative colitis.
2. Targeted therapy (biological preparations)
    - infliximab (Remicade) - chimeric monoclonal antibody (human + mouse) against TNF-α - in resistance to conventional therapy;
    - adalimumab (Humira) - human monoclonal antibody.
3. Nutritional therapy
    - complete enteral nutrition can induce remission - complete enteral nutrition (elementary diet based on amino acids) for 4-6 weeks reduces inflammation (especially in children) but often relapses after cessation.
4. Surgical therapy
    - risk of recurrence even after successful surgery;
    - indicated for complications (perforation, bleeding, fistula, abscesses, strictures, marked growth retardation, tumors).
    - resection with anastomoses or stoma,
    - stricturoplasty and balloon dilatation of stenoses,
    - drainage of abscesses,
    - fistulotomy,
        - resections should be as small as possible (possibility of repeated resections in case of recurrences, need to maintain at least 60 cm of the small intestine, strictures rather than resections are preferred), end-to-end anastomoses, stomachs in acute conditions, or if the rectal area cannot be reconstructed, during reconstruction in the area of the rectum do not create pouches, performances:
            - segmental resection of the small and large intestine,
            - ileocecal resection with ileo-ascendent anastomosis,
            - right hemicolectomy with ileo-transverse anastomosis,
            - subtotal colectomy with ileo-rectoanastomosis,
            - proctocolectomy with ileostomy,
            - abdominoperineal amputation with a colostomy,
        - if the rectum is not affected, it is more advantageous to keep it even during a permanent ileostomy (examination of pelvic nerve plexuses - sexual function, the disadvantage is the need for repeated inspections of the rectum to see if there are any inflammatory lesions),
        - appendectomy means the risk of fistula formation, but rather it is performed, because in case of recurrence we can rule out appendicitis as the cause of the problem.

Prevention

- It is not known because the reason for the auto aggression of the immune system is not explained.

Crohn's disease versus ulcerative colitis

	Crohn's disease	Ulcerative colitis
localization	celý trávicí trakt, nejčastěji terminální ileum	rektum a kolon
abdominal X-ray	segmental involvement (alternation of inflammatory and unaffected sections), thickening of the intestinal wall,	continuous oral procedure, the disappearance of haustration
endoscopy	discontinuous involvement, focal aphthae, linear ulcers	hemorrhagic mucosa, diffuse inflammation, pseudopolyps
histology	inflammation of all layers of the intestinal wall (transmural), typical epithelioid granulomas, lymphocytic infiltrates	inflammation of the mucosa and submucosa, cryptitis, crypt abscesses
the clinical picture	abdominal pain, weight loss, diarrhea with blood and mucus	bloody diarrhea with tenesmus
complications	fistula, stenosis, and abscess formation	increased risk of cancer/megacolon

Links

Related articles

- Nespecifické střevní záněty
- Ulcerózní kolitida
- Crohnova choroba/etiopatogeneze

External links

- ZÁDOROVÁ, Zdena. *Česká gastroenterologická společnost : Nespecifické střevní záněty* [online]. ©2007. Poslední revize 2009-01-23, [cit. 2010-05-02]. <https://www.cgs-cls.cz/informace-pro-pacienty/nespecificke-strevni-zanety/>.

- Crohnova choroba – obrázky (www.kolonoskopie.cz)
- Crohnova choroba – diagnostické markery, vzorky

References

1. ↑ BERNSTEIN, Charles N, Andre WAJDA a Lawrence W SVENSON. The Epidemiology of Inflammatory Bowel Disease in Canada: A Population-Based Study. *The American Journal of Gastroenterology.* 2006, roč. 7, vol. 101, s. 1559-1568, ISSN 0002-9270. DOI: 10.1111/j.1572-0241.2006.00603.x.
2. ↑ GHIONE, Silvia, Hélène SARTER a Mathurin FUMERY. Dramatic Increase in Incidence of Ulcerative Colitis and Crohn's Disease (1988–2011): A Population-Based Study of French Adolescents. *American Journal of Gastroenterology.* 2018, roč. 2, vol. 113, s. 265-272, ISSN 0002-9270. DOI: 10.1038/ajg.2017.228.
3. ↑ ROBERTS, S E, K THORNE a N THAPAR. A Systematic Review and Meta-analysis of Paediatric Inflammatory Bowel Disease Incidence and Prevalence Across Europe. *Journal of Crohn's and Colitis.* 2020, roč. 8, vol. 14, s. 1119-1148, ISSN 1873-9946. DOI: 10.1093/ecco-jcc/jjaa037. .
4. ↑ SCHWARZ, Jan, Josef SÝKORA a Dominika CVALÍNOVÁ. Inflammatory bowel disease incidence in Czech children: A regional prospective study, 2000-2015. *World Journal of Gastroenterology.* 2017, roč. 22, vol. 23, s. 4090, ISSN 1007-9327. DOI: 10.3748/wjg.v23.i22.4090.
5. ↑ Skočit nahoru k:a b c d e f g h i Chybná citace: Chyba v tagu <ref>; citaci označené KlinPed2012 není určen žádný text
6. ↑ MUNTAU, Ania Carolina. *Pediatrie.* 4. vydání. Praha : Grada, 2009. s. 372-377. ISBN 978-80-247-2525-3.

Resources

- PASTOR, Jan. *Langenbeck's medical web page* [online]. [cit. 2010]. <https://langenbeck.webs.com/>.

- BENEŠ, Jiří. *Studijní materiály* [online]. ©2007. [cit. 2010]. <http://www.jirben.wz.cz/>.

- ŠTEFÁNEK, Jiří. *Medicína, nemoci, studium na 1. LF UK* [online]. [cit. 2009]. <https://www.stefajir.cz/>.