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PROGNOSTICATION OF POLYP LESION STRUCTURE OF THE COLON PORTIONS FOR NEAR-TERM OUTLOOK

Abstract. *to prognosticate the structural parameters of polyp lesions of the colon for 2018 in Lviv region. Retrospective analysis of 51 consulting conclusions concerning the cases of polyp lesion of the colon has been performed. Consulting was conducted at the Department of Pathologic Anatomy and Forensic Medicine, Danylo Halytsky Lviv National Medical University for the period of 2016. With the purpose to prognosticate the structural parameters of polyp lesions of the colon for 2018 we have applied the method of exponential smoothing: Holt two-parametric method. The sense of this method is the following: results of prognostication are constantly adapted to new information obtained, which in its turn increase the accuracy of prognostication reliably. Therefore, the results of prognostication depend mostly on the rates which are most closely to the beginning of a prognosticating period (in our case these are investigations of 2016), and as the parameters are further from the end of the dynamic line they less influence upon the results of prognostication. The study demonstrated a tendency to increase of certain histological kinds of colon polyps and their topographic location. It can be affirmed that for near-term outlook under other unchanged conditions in Lviv region the tendency to increase of five histological kinds will be observed: inflammation polyp, tubular adenoma, papillary adenoma, hyperplastic polyp and juvenile polyposis. As to another nosology for near-term outlook there will be a tendency to their decrease in the structure of polyp lesions of the colon.*

Key words: *structure, polyps, adenomas, colorectal cancer.*

Introduction. the number of patients suffering from colon diseases has been constantly increasing. Every year the WHO estimates over 940 000 new cases of colorectal cancer. Colorectal cancer (CRC) is most often detected on later stages – the frequency of detection of the 3-4th stage is 70% of all the cases found [1]. CRC sickness rate is considerably higher after the age of 50, and its frequency has been increasing in recent twenty years [3]. Survival rate for the last five years has increased from 46 to 62%, although the value of this index is completely determined by the stage of the disease on the moment the diagnosis is made [1, 6]. Considering these data we have to admit that more than in the half of cases the diagnosis is late. At the same time, there are reliable evidences that reduced mortality due to CRC can be achieved by means of detection and treatment of its early forms together with detection and removal of adenomatous polyps [4].

Therefore, close to real cause of polyp frequency can be determined only as the result of

targeted preventive mass examinations of the population or dissection. The majority of cases have the period of latent (asymptomatic) course, followed by the signs of the disease not considered by the patient himself, and most often are characterized as “intestinal discomfort”, while pathomorphologic changes are available in the colon [2, 5, 6]. The commonest lesion of the colon is polyp (colon polyp - CP) including all the processes associated with protrusion of the mucous membrane into the colon lumen [1, 3, 4]. A part of them, adenomas in particular, belong to obligate pre-cancer formations, which in case of untimely diagnostics and inadequate treatment can transform into colorectal cancer [1, 5]. Prognostication of the structural parameters of obligate pre-cancer conditions can help to predict a probable number of cases on colorectal cancer for the nearest future.

Objective: to prognosticate the structural parameters of polyp lesions of the colon for 2018 in Lviv region.

Materials and methods: retrospective analysis of 51 consulting conclusions concerning the cases of polyp lesion of the colon has been performed. Consulting was conducted at the Department of Pathologic Anatomy and Forensic Medicine, Danylo Halytsky Lviv National Medical University for the period of 2016. With the purpose to prognosticate the structural parameters of polyp lesions of the colon for 2018 we have applied the method of exponential smoothing: Holt two-parametric method. The sense of this method is the following: results of prognostication are constantly adapted to new information obtained, which in its turn increase the accuracy of prognostication reliably. Therefore, the results of prognostication depend mostly on the rates which are most closely to the beginning of a prognosticating period (in our case these are investigations of 2016), and as the parameters are further from the end of the dynamic line they less influence upon the results of prognostication.

Results. While making prognostication concerning a part of polyp lesions in the colon (Fig. 1) on the basis of real findings (blue line) we have predicted the indices for 2018 (red line). The presented data demonstrate that the prognosticated indices are mostly effected by real values of the recent years (2014–2016), when the analyzed parameter decreased – even to its complete absence in 2015. Thus, a prognosticated value in 2018 will be 0,24%.

To determine an optimal pattern of prognostication we have determined alpha- (enables to determine the level of rank) and gamma- (enables to determine curve inclination) coefficients for every from the equation. Thus, we have developed an array of equations for every prognosticated parameter (location or histology), and the best ones were determined among them. The criteria of choice were the utmost

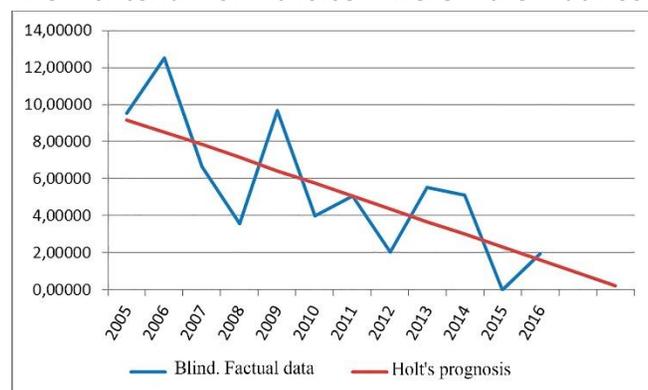


Fig. 1 Real and prognosticated values of a share of polyp lesions in the colon.

coincidence of conditionally prognosticated and real data, and the smallest average values of an absolute residue square. Therefore, in prognostication of a share of polyp lesions in the colon for 2018 an optimal equation has alpha-coefficient 0,01 and gamma-coefficient 0,01.

Discussion. Summarizing the results of work with the array of equations in prognostication of a share of polyp lesion depending on the location in the colon portions, we have designed the Table 1 presenting alpha- and gamma-coefficients to prognosticate a share of every portion for 2018.

Thus, using certain primary real data and obtained alpha- and gamma-coefficients we have prognosticated that in 2018 in Lviv region under other unchanged conditions the structure of polyp lesions of the colon depending on the location of a focus of lesion will be the one presented in Table 2. Therefore, it can be stated that in 2018 under other unchanged conditions in Lviv region a tendency to increase a share of polyp lesion in the transverse-segmented, descending and sigmoid portions of the colon will be found. In other portions there will be a tendency to decrease their share in the structure of polyp lesions in the colon. Similar to the prognostication of a share of polyp lesions depending on their location in the colon we have developed an array of equations to prognosticate the structure of histological types of polyp lesions for the nearest future. The most optimal alpha- and gamma-coefficients for every of such prognosis are presented in Table 3.

Table 1
Alpha- and gamma-coefficients of the obtained equations to prognosticate a share of polyp lesions in different portions of the colon for 2018.

No	Location	Alpha-coefficient	Gamma-coefficient
1	Cecum	0,01	0,01
2	Ileum	0,00	0,00
3	Hepatic flexure	0,00	1,00
4	Transverse-segmented	0,035	1,00
5	Spleen flexure	0,005	1,00
6	Descending portion	0,451	0,00
7	Sigmoid	0,02	1,00
8	Rectal-sigmoid junction	0,01	0,01
9	Rectum	0,034	0,00
10	Anus	1,00	0,00

Table 2

Prognosticated for 2018 structural parameters (%) of polyp pending on their location

No	Location	P±m, %
1	Cecum	0,24±0,05
2	Ileum	4,85±0,68
3	Hepatic flexure	0,02±0,01
4	Transverse-segmented	12,02±1,03
5	Spleen flexure	0,03±0,01
6	Descending	7,47±0,83
7	Sigmoid	38,04±1,54
8	Rectal-sigmoid junction	5,30±0,71
9	Rectum	32,00±1,48
10	Anus	0,03±0,01
	Total	100,00

Table 3

Alpha- and gamma-coefficients of the obtained equations to prognosticate a share of different nosology units of polyp lesions in different portions of the colon for 2018.

No	Nosology unit	Alpha-coefficient	Gamma-coefficient
1	Inflammation polyp	0,05	1,00
2	Fibrous polyp	0,451	0,00
3	Tubular adenoma	0,00	0,00
4	Papillary adenoma	0,012	1,00
5	Tubular-papillary adenoma	0,00	0,00
6	Hyperplastic polyp	0,653	0,00
7	Juvenile polyposis	0,00	0,00
8	Peutz-Jeghers polyposis	1,00	0,00
9	Family polyposis	0,944	0,00
10	Shaped polyp	0,00	0,086

Analogically, using the primary real data and obtained alpha- and gamma-coefficients we have prognosticated that in Lviv region in 2018 under other unchanged conditions the structure of polyp lesions in the colon depending on histological type would have the following presentation as in the Table 4.

Conclusions: therefore, it can be affirmed that for near-term outlook under other unchanged conditions in Lviv region the tendency to increase of five histological kinds will be observed: inflammation polyp, tubular adenoma, papillary adenoma, hyperplastic polyp and juvenile polyposis. As to another nosology for near-term outlook there will be a tendency to their decrease in the structure of polyp lesions of the colon.

Table 4

Prognosticated for 2018 the parameters of structure (%) of polyp lesions in the colon depending on histological type.

No	Histological type	P±m, %
1	Inflammation polyp	16,96±1,19
2	Fibrous polyp	0,18±0,03
3	Tubular adenoma	45,29±1,57
4	Papillary adenoma	20,20±1,27
5	Tubular-papillary adenoma	5,85±0,74
6	Hyperplastic polyp	9,22±0,91
7	Juvenile polyposis	2,25±0,47
8	Peutz-Jeghers polyposis	0,02±0,01
9	Family polyposis	0,00±0,00
10	Shaped polyp	0,03±0,01
	Total	100,00

Prospects of further studies: the results of the study are promising concerning their practical use; they can form a basis for diagnostics and prognostication of polyp lesion occurrence in future and as a result, a part of a probable risk group as to the development of colorectal cancer among the population of Lviv region.

References:

1. ASGE guideline: The role of endoscopy in the diagnosis, staging, and management of colorectal cancer. *Gastrointest Endosc.* 2005 Sep 15;61:1-6.
2. Atkin WS, Cook CF, Cuzick J, Lancet J et al. Single flexible sigmoidoscopiescreening to prevent colorectal cancer: Baseline findings of a UK multicentre randomised trial. 2002 Jan 12; 359(9314):1291-1300.
3. Imperiale TF, Wagner DR, Lin CY et al. Risk of advanced proximal neoplasms in asymptomatic adults according to the distal colorectal findings. *N. Engl. J. Med.* 2000 Nov 30;343:169-174.
4. Screening for Colorectal Cancer: Recommendation and Rationale U.S. Preventive Services Task Force. 2002;137(2):129-131.
5. Winawer SL, Zauber AG, Ho MN et al. Prevention of colorectal cancer by colonoscopic polypectomy. The National Polyp Study Workgroup. *N. Engl. J. Med.* 1993 Mar 1;329:1977-1981.
6. Winawer S, Fletcher R, Rex D et al. Colorectal cancer screening and surveillance: clinical guidelines and rationale-Update based on new evidence. *Gastrointestinal Consortium Panel Gastroenterology.* 2003 Jan 10;124(2):544-60.