

# Perforated peptic ulcers in Belarus: past and present

## Prakiurusios pepsinės opos Baltarusijoje: praeitis ir dabartis

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### Objective

The monitoring of perforated peptic ulcer incidence in Belarus is reviewed for the years 1960–2004.

### Methods

The review of the annual incidence of perforated peptic ulcers during 1960–2004 is based on the official statistics of the Belorussian Ministry of Public Health. The index of perforated ulcer incidence per 100,000 population has been derived, with the account of population changes during these years.

### Results

Mild variations of these statistics were observed before the 90s with an insignificant tendency to grow from the second half of the 70s to the first half of the 80s. The Chernobyl accident in 1986 was not followed by any response. The incidence of perforated peptic ulcers almost doubled in the first half of the 90s, regional differences in the statistics appeared. These changes coincided with the collapse of the USSR and deterioration of the living standards. Hence, the socioeconomic factor has a dominating influence governing the risk of peptic ulcer complications, perforations in particular.

### Conclusion

The author emphasizes the need to promote the role of public prophylaxis and definite preventive surgery for the patients with a severe ulcer evolution.

**Key words:** perforated peptic ulcer, incidence

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### Introduction

Perforation is a vitally dangerous complication occurring among 5–10% of peptic ulcer patients on the average [1, 2]. Yet, in case patients are exposed to

excessively unfavorable factors, while lacking an adequate preventive treatment, the risk of perforation may aggravate strongly [3, 4]. Currently the duodenal localization accounts for the majority of ruptures

(75–85%) [5–7]. Most of ulcer patients belong to the active age, with a strong domination of ulcer incidence among men, ten times more often on the average than among women [8, 9]. The incidence of perforated ulcers in the economically developed countries numbers 5–7 per 100,000 [10–12]. The international cohort studies show that mortality during the last 30 years has not been tending to reduce; it accounts for 5–13% in case of duodenal ulcer perforations, 2–3 times more in case of gastric ulcer perforations [13–15]. Ulcer suturing is a routine surgery in the majority of clinics, with the results of this non-radical operation far from successful. If the adequate medical treatment is not carried out, ulcer recurrence is observed among 50–70% patients during the first post-operation year, about 60% and more have to undergo another operation before 10 years elapse due to the evolution of stenosis, re-perforation, massive hemorrhage or combined complications [16, 17].

### Patients and methods

The incidence of perforated peptic ulcers has marked a strong leap in the NIS and in Belarus specifically [18–20]. However, so far no purposeful long-term evaluation of the incidence of perforated ulcers has been

accomplished in the Republic. The objective of the present study was to perform a long-term (45 years) monitoring of perforated gastroduodenal ulcers in Belarus and to reveal the tendencies of ulcer complication and major risk factors.

The review of the annual incidence of perforated peptic ulcers during 1960–2004 is based on the official statistics of the Belorussian Ministry of Public Health. The index of perforated ulcer incidence per 100,000 has been derived with the account of population changes during these years in the Republic in general (Table). This indicator has also been calculated for regions and for Minsk, the capital of Belarus. A comparative statistical analysis of the perforated ulcer incidence and morbidity has been performed for each decade of the period in question. Valid tendencies of the dynamics of these indicators have been revealed. Basic macrosocial factors provoking the incidence of perforated ulcers at present have been determined.

### Results

The annual number of perforated peptic ulcers amounted to 1,050 (1969) and up to 1,272 (1966) on the average in the 60s in the Republic, the mean one during the decade being  $1,143.6 \pm 56.2$ . The incidence remained within the range 11.7–14.6,

**Table.** Perforated peptic ulcers in Belarus: numbers and incidence

<b>60s</b>	<b>1960</b>	<b>1961</b>	<b>1962</b>	<b>1963</b>	<b>1964</b>	<b>1965</b>	<b>1966</b>	<b>1967</b>	<b>1968</b>	<b>1969</b>
Absolute number	1096	1059	1181	1110	1188	1122	1272	1191	1167	1050
Per 100,000	13,4	12,8	14,1	13,1	13,9	13,0	14,6	13,5	13,1	11,7
<b>70s</b>	<b>1970</b>	<b>1971</b>	<b>1972</b>	<b>1973</b>	<b>1974</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>	<b>1978</b>	<b>1979</b>
Absolute number	1129	1114	1122	1219	1432	1459	1628	1510	1515	1475
Per 100,000	12,5	12,2	12,2	13,4	16,0	15,6	17,3	16,0	15,9	15,4
<b>80s</b>	<b>1980</b>	<b>1981</b>	<b>1982</b>	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>
Absolute number	1593	1543	1549	1613	1714	1499	1445	1308	1340	1442
Per 100,000	16,6	15,9	15,8	16,4	17,3	15,0	14,4	12,9	13,2	14,1
<b>90s</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Absolute number	1260	1430	1941	2179	2685	2298	2621	2607	2467	2492
Per 100,000	12,3	13,9	18,8	21,0	25,9	22,2	25,5	25,5	24,2	24,8
<b>Present decade</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>					
Absolute number	2559	2678	2414	2441	2384					
Per 100,000	25,6	26,9	24,3	24,8	24,3					

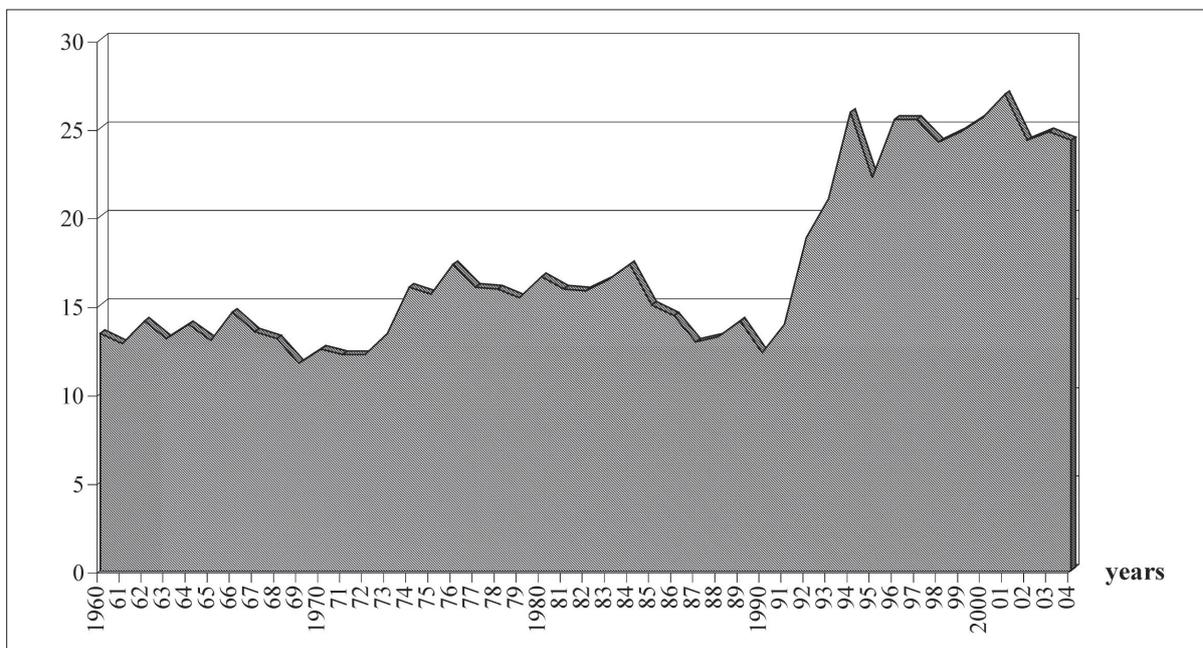
or  $13.3 \pm 0.6$  on the average. The minimal incidence occurred in Minsk and the maximum in the Brest region.

The annual number of peptic ulcer perforations in the 70s amounted from 1,114 (1971) to 1,628 (1976), or  $1,368.3 \pm 173.8$  during the decade on the average. The general incidence in the Republic ranged within 12.2–17.3 per 100,000, mean  $14.7 \pm 1.7$ . The mean index was minimal in Minsk, with the Gomel region showing the maximum. The incidence below 10 was only twice registered in Minsk (in 1972 and 1973). It is important to accentuate that the incidence of perforated ulcers never exceeded 20 per 100,000 in Belorussia during the 60–70s.

The number of perforated gastro-duodenal ulcers in the 80s showed from 1,308 (1987) to 1,714 (1984), or  $1,505.0 \pm 98.2$  on the average. The average incidence in the republic ranged within 12.9–17.3 during these years, or  $15.2 \pm 1.2$  on the average. Minsk showed the minimum again and the Moguilev region the maximum. The ceiling of 20 was once exceeded in 1980 in the latter region.

Unlike the preceding three decades, the situation changed radically in the early 90s. Annually from 1,260 (1990) to 2,685 (1994) perforated peptic ul-

cers occurred in the Republic, or  $2,198.0 \pm 396.4$  on the average. The average incidence ranged between 12.3 and 25.9 per 100,000; the average during the decade was  $21.4 \pm 3.9$ . The minimal incidence remained in Minsk, while the Vitebsk region showed the maximum in the 90s. During this decade the ceiling of 30 cases was exceeded: three times in the Vitebsk region (1994, 1996 and 1999) and once in the Gomel region (1998). The start of the 21<sup>st</sup> century gives no grounds for optimism yet. The unbridled growth of perforated ulcers experienced during the first half of the 90s has ceased, but the level is still very high. The incidence of perforated peptic ulcers in 2001 amounted to 2,678 and to 2,378 in 2004. During these years the incidence was 26.9 and 24.3 per 100,000, respectively. The eastern regions of the Republic continue to remain the leaders: in the Vitebsk region, the incidence exceeded 30.0 four times during the last five years, in the Gomel region once and in the Moguilev region two times. The highest level of perforated ulcers (33.2 cases per 100,000) is noted in the latter region (2000) during the whole period. The figure shows the dynamics of perforated ulcer incidence in Belarus.



**Figure.** Dynamics of perforated peptic ulcer incidence in Belarus 1960–2004 per 100,000

The dynamics of this incidence monitored during a sufficiently long period leads to definite conclusions both regarding peptic ulcer disease in general and the problem of perforated ulcers in particular. It is believed, in the first place, that the incidence of perforated ulcers can serve as an integrating criterion of the peptic ulcer disease severity in the patients' population and the effectiveness of medical care of such afflictions. It is fully apparent that, in case this index shows a stable growth, medical care should be adequately modified and tailored to such patients. To keep the incidence of perforated ulcers down within an optimal range (below 5.0–7.0 per 100.000 in the economically developed countries) the quality of conservative treatment should be improved on the public scale, on the one hand, and the role of definite preventive surgery among patients with a potential risk of perforation should be promoted on the other. Effective cooperation between gastroenterologists and surgeons would theoretically reduce the risk of such complications to "blind" perforations or piercing among the patients ignoring medical recommendations.

## Discussion

Thus, the incidence of perforated ulcers did not show any stable dynamics of growth before the 90s. The differences of the incidence from year to year reflected natural variations. The first half of the 70s showed some rise of the incidence, after that it stabilized until the middle 80s at an average level of  $16.2 \pm 1.4$ , and then the level went down during 1985–1990 to  $13.7 \pm 1.2$ . We believe it is highly noteworthy that the Chernobyl accident (1986) took place exactly during this period. It is commonly admitted that the psycho-emotional stress affects the severity of peptic ulcer evolution. It is beyond any doubt that the Chernobyl accident became a powerful stress factor. Surprisingly, the disaster did not provoke any response among the patients with potentially possible perforations. By the way, the cause of the lack of increase of perforated peptic ulcer frequency after the nuclear disaster is not the topic of this study.

Without any exaggeration, the incidence of perforated ulcers snowballed after 1991. Compared with 1985–1991 when the incidence reduced, and after

some stabilization at a new level in 1994–2004 the incidence doubled. The collapse of the USSR followed by a drastic drop of public well-being triggered off an unprecedented growth of perforated peptic ulcers. The crisis the society had to live through has become an incomparably more essential stress factor for the category of the patients studied than the Chernobyl accident. It is important that the increase of incidence of perforated ulcers is not only the Belorussian phenomenon. The same changes are marked nearly in all post-soviet states.

Examination of the regional features of perforated ulcer incidence shows a number of regularities. The minimum was registered in the capital of Belarus, differing 1.2–1.3 times from the average in the Republic. It is believed to be due to a higher socio-economic status of the population in Minsk as well as to a better availability of qualified medical care than in the regions. The incidence in the regions did not show any valid difference in the 60s and 70s. A relatively higher incidence in the 80s occurred in the Moguilev region. The maximum difference appeared in 1994–2004. The incidence was higher in the eastern regions and lower in the western district than elsewhere in the Republic. In addition to the favorable situation in Minsk, the same situation was in the Grodno region. The territorial differences in the incidence of perforated ulcers thus appeared in the critical 90s. They are believed to be primarily due to different standards of life in the regions, since traditionally western regions have enjoyed a higher standard of well-being and have had more resources to solve their problems on a large scale<sup>1</sup>. The regional difference in the incidence may also be due to the proportion of urban and rural population, with the urban population more numerous in the eastern regions than in the western regions. The incidence of ulcers and its complications are more frequently registered among city dwellers.

Summarizing the results of the long-term dynamics of the incidence of perforated gastroduodenal ulcers in Belarus, the following can be concluded:

- the socioeconomic factor exerts a dominating effect on the risk of occurrence of perforations as a complication of peptic ulcer;

- a poor socioeconomic status should be treated as the most essential individual factors of ulcer complications;
- the negative effect of the crisis on the evolution of peptic ulcers can be overcome by promoting the effectiveness of public prophylaxis and the role of surgery planning;
- the incidence of perforated gastroduodenal ulcers should be included in the annual gastroen-

terologia statistics as an integrated criterion of the effectiveness of medical care and treatment of peptic ulcers;

- as the number of patients with sutured perforations keeps adding, the need of surgical treatment should be expected to grow in the coming years as new complications appear among a substantial proportion of such patients (gastric outlet obstructions, bleedings, recurrent perforations).

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## Nuomonė

Vladimiro M. Lobankovo straipsnyje "Perforated peptic ulcers in Belarus: past and present" nagrinėtas prakiurusių gastroduodeninių opų dažnumas Baltarusijoje dekadomis (nuo 1960 metų iki 2000 metų). Nors straipsnio pavadinimas apima labai plačią temą, šiame darbe tirtas tik vienas prakiurusių opų požymis – jų dažnumas. Šis požymis ištirtas labai gerai. Prakiurusių opų dažnumas išnagrinėtas ir Baltarusijos rytiniuose regionuose, ir vakariniuose, ir didžiausiuose šalies miestuose. Statistiškai tinkamai ir aiškiai apdoroti duomenys.

Tema aktuali, įdomi ir nagrinėtina. Gaila, kad išvados grindžiamos tik šiuo vieninteliu statistiniu rodikliu ir literatūros duomenimis. Sutinku su autoriumi dėl prakiurusių opų dažnumo (5–10%), lokalizacijos (85% dvylikapirštėje žarnoje) ir mirtingumo po operacijų (5–13%). Nenorėčiau sutikti dėl opos recidyvo dažnumo po operacijos pirmaisiais metais (50–70%) ir po 10 metų (apie 60%). Medicinos literatūroje galima rasti tokių duomenų, kurie yra parankiausi straipsnio autoriui. Pavyzdžiui, yra literatūros šaltinių, kurių autoriai [1, 2] propaguoja netgi nechirurginį, o konservatyvų prakiurusių opų gydymo būdą. Įkišus zondą į skrandį, sudaromas nuolatinis siurbimas ir dėl susidariusio neigiamo slėgio prie prakiurusios opos prilimpa didžioji taukinė. Tokio gydymo rezultatai, autorių nuomone [2], panašūs kaip ir po chirurginių operacijų. Taigi įdomiausi yra savo duomenys, kurių vertė bei rezultatai išaiškėja lyginant su kitų klinikų rezultatais.

Kodėl opos po operacijų atsinaujina, koks jų skaičius Baltarusijoje ir kai kuriuose Baltarusijos regionuose, didžiuosiuose miestuose? Negi tik užsiuvamos prakiurusios opos, ar yra atliekamos piloroplastinės operacijos su įvairiomis vagotomijomis? Kaip užsiuvamos prakiurusios opos, kokiū būdu? Ką autoriai vadiną gastroduodeninėmis opomis? Ar yra skirtumų tarp prakiurusių skrandžio ir dvylikapirštės žarnos opų? Deja, skaitydamas straipsnį pasigendu atsakymų į šiuos klausimus. Darbe jie kliudomi tik hipotetiškai, o paskui daromos plačios išvados.

Socialinių ir ekonominių veiksnių įtaka opaligei seniai žinoma, bet reikėtų juos detalizuoti ir objektyviai ištirti vietoje. Manau, kad tam tikrų gyventojų

sluoksnių socialinės ir ekonominės sąlygos skiriasi ne tik Baltarusijoje ar Lietuvoje, bet ir įvairiuose miestuose. Autorius trumpai pamini Minską, Vitebską, Gomelį, bet tai nesukonkretinta. Gal skaitytojams būtų aiškiau, jeigu būtų dar koks nors statistinis rodiklis (pvz., minimalus pragyvenimo lygis arba minimali alga)?

Statistiniai įvairių šalių rodikliai taip pat ne visada reikšmingi. Jie išryškunami su kuo nors lyginant. Ar sluoksniuojasi Baltarusijos visuomenė (turtingi labiau praturtėjo, o vargšai dar labiau nuskurdo)? Koks prakiurusių opų dažnis šiose grupėse? Gal opų prakiurimas padažnėjo todėl, kad turtingi Baltarusijos piliečiai emigravo, ir šalyje pasiliko daugiau žmonių, gyvenančių ties skurdo riba? Tai įdomi tema, bet ji lieka tik teoriniuose samprotavimuose. Straipsnyje apie tai objektyvių duomenų nėra.

Skaitant susidaro nuomonė, kad autorius labai pesimistiškai žiūri į šiuolaikinės opaligės medikamentinį gydymą (*H. pylori* eradikacija; H2 blokatorių ir PSI skyrimas po operacijų). Nors konkrečių duomenų nėra, bet juntamas tradicinis daugelio vyresnių chirurgų neigiamas požiūris (50–60% recidyvų!) į medikamentinį opaligės gydymą. Taigi kaip Baltarusijoje žiūrima į šiuolaikinį medikamentinį gydymą, koks dažniausias stereotipinis pooperacinis gydymas opą tik užsiuvus? Į šiuos klausimus atsakymo nėra, nors straipsnio pavadinimas įpareigotų tirti ir svarstyti šias problemas.

Įdomiausia išvada ta, kad Baltarusijos žmonės didesnius psichologinius ir socialinius sukrėtimus patyrė ne po Černobylio avarijos, o subyrėjus SSRS. Man ši išvada labai netikėta. Autorius remiasi patikimais, oficialiais ir akivaizdžiais duomenimis. Vien dėl šių duomenų straipsnis yra vertingas.

Sutinku su visomis kitomis autoriaus išvadomis. Deja, jos yra daugiau teorinio pobūdžio ir suformuluotos empiriškai, remiantis savo didele chirurgo patirtimi.

Reikia pabrėžti, kad surinkta daug medžiagos, duomenys kaupiti nuolat ir jų rezultatai reikšmingi, atliktas didelis tiriamasis darbas.

Nepaisant minėtų kritinių pastabų manau, kad V. M. Lobankovo straipsnis aktualus, svarbus ir tinkamas spaudai.

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**Invited commentary**

The paper presented by V.M. Lobankov “Perforated peptic ulcers in Belarus: past and present” is a descriptive study on incidence of perforated peptic ulcers in Belarus during 1960–2004. The study was based on a single source – the official statistics of the Belarussian Ministry of Public Health where the data was collected routinely using the standard reporting procedures.

From the figures we can easily distinguish the three periods – before the 1990, 1990–1994 and after. Only the period 1990–1994 can be recognized as showing noticeable annual changes of the rates. Author provides explanations based on different grounds focusing attention of the reader on the socio-economic factors that are supported by examination of regional rates. The interpretation of the findings using such type of sources should be accepted with reservation. Checking the completeness and validity of the source using clinical data is important to remove the bias of observation and case ascertainment.

Such dramatic changes of the rates in Bellarus in such a short period are worth studying in more detail. The information such as changes in medication, the use of NSAID (non steroid antiinflammatory agents) as aspirin, *Helicobacter* infection, change in life styles, nutrition and supplements, consumption of alcohol and tobacco, ageing of population can be helpful to explain the situation in the country. In many coun-

tries the distribution of age, sex and ulcer site changed toward more elderly patients. Traditional trend analysis can be helpful for explaining the changes of the rates.

In the literature, some authors suggest the increase to be due to anxiety, poorer eating habits, irregular and abnormal working hours, which are a result of the war or crucial socio-economic changes in the society. For instance, during the starvation in Russia the incidence of ulcer perforation increased ten-fold. Other reports show that there was noted an increase in the number of peptic ulcer perforations in London since the onset of the war and an increased incidence of relapses in patients with peptic ulcers while in the Army. Susceptibility to ulcer perforation seems to follow birth cohorts, and major etiologic factors should be sought in prenatal life, in childhood, or in life-style factors that follow the birth.

The figures presented by V. M. Lobankov might be an introductory point for future studies with the focus on the clinical management, risk factors, health care and life styles of the general population.

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