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*Efficacy of the triple therapy: proton pump inhibitors, amoxicillin  
and tinidazole in Helicobacter pylori infection treatment*

The history of relationship between bacterial infection and upper gastrointestinal tract disease has already more than one hundred years. First reports in the literature were given by Krienitz, Doenges, Freedberg and Barron. The last two of them used Warthin-Starry silver method staining. Later data come from Palmer, Steer and Colin-Jones (12). Important progress occurred in 1983 when Warren and Marschall from Australia discovered in human stomach bacteria, first called *Campylobacter pyloridis* and later *Helicobacter pylori* (4). Further reports referred to bacterial epidemiology, pathology (14, 15) and also diagnosis of contamination (11). The most essential problem is still connected with treatment of indications and the meaning of *Helicobacter pylori* eradication. Up till now there have been reported more than 130 therapy ideas and also there are many recommendations for each of them. The best known are: *The Report of American Digestive Health Foundation*, *The Asia Pacific Consensus Conference*, *The Maastricht Consensus Report* (4, 10). Recommendations clearly indicate diseases being qualified to eradication treatment (4, 9, 11). To obtain complete elimination of contamination the seven- to ten-day triple therapy composed of proton pumps inhibitor with two antibiotics (6, 8, 10). Popular are also bismuth salts which in connection with other drugs determine the efficient form of treatment (7).

The aim of this study is to present the results of *Helicobacter pylori* infection treatment in duodenal ulcer and duodenal inflammation patients.

## MATERIAL AND METHODS

Since 1998 till 2000 2,548 upper gastrointestinal endoscopies were done in Kraśnik Regional Hospital (average number of gastroscopies was per year 849). All examinations were done in Hospital Endoscopy Department, whose treatment area embraces about 106,000 inhabitants. These numbers indicate that over 2.4% of this region population were examined. In this group there were both hospital patients – 1,639 and outpatients – 909.

In the present study we examined only ambulatory patients. We tried to estimate the efficiency of *Helicobacter pylori* eradication with the use of proton pump inhibitors, amoxicillin and tynidazol. The choice of undertaken treatment was supported by the theory confirmed by many authors that nowadays the most efficient is triple therapy (1, 3, 13). Among 909 ambulatory patients the group of 108 (11.88%) was selected for the study. There were 56 men (51.85%) and 52 women (48.15%). The age of the patients varied from 15 to 81 (mean age – 44 years; median – 48 years). Duodenal ulcer or duodenal inflammation with typical endoscopic picture of *Helicobacter pylori* infection was diagnosed in all the examined. Endoscopy examination was done without premedication, only with local throat anaesthesia by Xylocain in aerosol. The presence of bacterial contamination was confirmed by stomach biopsy of prepyloric region joint with quick urease test. In our study we used Polish urease test produced by Foods and Nourishments Institute in Warsaw. On a paper-disc, wetted with a drop of distilled water we carried out 1-2 biopsies of stomach mucus exactly sticking it to the basis.

Patients' treatment was according to the following scheme: For the first seven days we used: Proton pump inhibitors (omeprazol 0.02 g, pantoprazol 0.04 g, lanzoprazol 0.03 g) twice a day; Amoxicillin – 1.0 g – twice a day; Tynidazol – 0.5 g – twice a day. Then proton pumps inhibitors, maintained above, were used only once a day for the following fourteen days (8). All patients were controlled 30 days after the end of treatment. The estimation of treatment results was based on physical examination and subjective complaints. In case no symptoms had occurred release endoscopic examination with biopsy and quick urease test was repeated (6).

## RESULTS

In the examined group of 108 patient duodenal ulcer was diagnosed in 72 of them (66.66%) and duodenal inflammation in the rest of 36 (33.33%). According to the accepted scheme the patients were controlled in time limit 30 days from the end of treatment. The complete symptoms release was treated as a positive result. Such curing result was ascertained in 99 patients (91.66%). The lack of improvement was noted in 9 cases (8.34%), which is graphically represented in Figure 1. In the group of 72 patients with

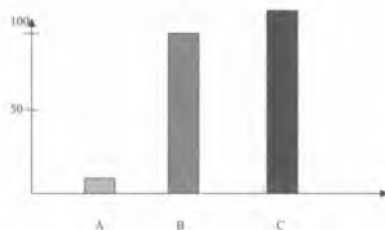


Fig. 1. A – negative results of treatment,  
B – positive results of treatment, C – all  
examined patients

duodenal ulcer complete improvement was obtained in 65 patients (90.27%) and in the group of 36 patients with duodenal inflammation in 34 cases (94.4%) – Table 1.

Table 1

Desease	Patients number	Positive result	%	Negative result	%
Duodenal inflammation	36	34	94.4 %	2	5.6 %
Duodenal ulcer	72	65	90.27 %	7	9.73 %
Total	108	99	91.66 %	9	8.34 %

In the cases when treatment did not achieve positive results controlled endoscopic examination with biopsy and urease test was done. Its results showed continuous *Helicobacter pylori* contamination. Another treatment scheme was used. Most of the time

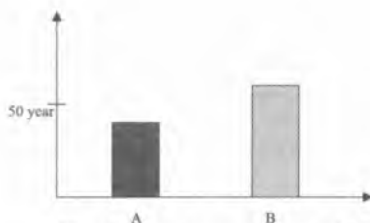


Fig. 2. A – average age of all  
examined patients, B – average  
age of negative results

it was quadruple therapy together with preparations of bismuth. (4, 7, 9). Adversity of treatments usually took place in older patients, where average age was 54.5 years (median 46.5). The average age of this group was about 10.5 higher than the average age of all the examined patients (Fig. 2). In 14 patients (12.96%) we noted side effects of eradication treatment. Among them dominated: bad feeling, weakness, headache, abdomen pain and nausea. These complaints occurred usually after 3-4 days of treatment and did not cause the abundance of the therapy.

## DISCUSSION

In 1996 *Helicobacter pylori* infection Group of Polish Society of Gastroenterology was established (10,14). The aim of this Group was to guideline the contamination and the treatment of *Helicobacter pylori* infection. In the choice of treatment the scheme we relied on reports about high efficiencies of triple therapy. Proton pumps inhibitors were used because of their high efficiency in ulcer disease treatment and also high efficiency of *Helicobacter pylori* eradication, which was confirmed in numerous papers (1, 13). Also amoxicillin shows high efficiency (over 80%) specially in connection with other proton pump inhibitors (1). The second used antibiotic was tynidazol – imidazol derivative. Its efficiency together with amoxicillin is proved by many authors (2, 3).

Our treatment results prove high efficiency of eradication by the use of mentioned-above drugs and also confirm the theory of seven-day triple therapy (8). In accordance with widely accepted treatment rules we refused obligatory endoscopic examination in all the attended. It was only executed in the case of the lack of clinical improvement. It is also widely discussed how to conduct the second attempt of eradication. In our work most often we used quadruple therapy based on bismuth citrate. This kind of therapy brought positive results in the examined patients. Decisions about continuous treatments were undertaken individually. They depended on the size of ulceration, the episodes of bleeding and recurrence of ulcer disease. We also follow the idea presented by other authors that the positive results of treatment occur only when permanent recovery of patients is observed, and not only short-term improvement. Some complications should be also underlined. The percentage of side effects during eradication can reach up to 15-30%. We did not note any cases of pseudomembranous colitis – regarded as the most serious kind of complications. The results of our investigations are comparable with those from the literature and prove high efficiency of this schema at comparatively low costs.

## CONCLUSIONS

1. Triple therapy with proton pump inhibitors, amoxicillin and tinidazole is an efficient method of *Helicobacter pylori* eradication.
2. This kind of therapy has a low side effects rate.
3. The worked out method permits to obtain good results at comparatively low treatment costs.

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#### SUMMARY

The aim of the paper is to present the triple therapy results combined with the application of proton pump inhibitors with amoxicillin and tynidazole in treatment of the contagion caused by *Helicobacter pylori*. The therapy was carried out among 108 people after realization of endoscopic biopsy and with quick urease test. In the endoscopic investigation 72 people were found to have duodenum ulceration. Inflammation of mucous duodenum was found in 36 patients. Among 108 people under investigation 51.85 % were men and 48.15 % women. These people were aged between 15-81 (the average age was 44). After the use of eradication 99 out of 108 patients (91.66 %) were cured. The lack of improvement was found in 9 people (8.34 %). The age of these people varied from 18 to 75, which gives the average age 54.5 (this age is about 10 years and a half higher in relation to the average age of the examined group of patients). The results prove high efficiency of this schema of treatment in relation to comparatively low costs. They also indicate greater efficiency of the treatment of contagions caused by *Helicobacter pylori* in younger people.

Skuteczność eradykacji trójlekowej z zastosowaniem inhibitorów pompy protonowej z amoksycyliną i tynidazolem w leczeniu zakażeń spowodowanych przez *Helicobacter pylori*

Celem pracy jest przedstawienie wyników eradykacji trójlekowej z zastosowaniem inhibitora pompy protonowej z amoksycyliną i tynidazolem w leczeniu zakażenia spowodowanego przez *Helicobacter pylori*. Terapię przeprowadzono wśród 108 osób po wykonaniu endoskopii z biopsją i szybkim testem ureazowym. W badaniu endoskopowym stwierdzano owrzodzenie dwunastnicy (72 osoby) lub zapalenie błony śluzowej dwunastnicy (36 osób). Wśród badanych 108 osób 51,85 % stanowili mężczyźni, a 48,15 % było kobietami. Były to osoby w wieku 15-81 lat (średnia wieku 44 lata). Po zastosowaniu eradykacji stwierdzono wyleczenie u 99 osób na 108, czyli w 91,66 %. Brak poprawy stwierdzono u 9 osób (8,34 %) – były to osoby w wieku 18-75 lat, co daje średnią 54,5 roku życia (wiek o 10,5 roku wyższy w stosunku do średniego w badanej grupie). Niepożądane objawy uboczne obserwowano u 14 osób, co stanowi 12,96 % badanej grupy. Uzyskane wyniki dowodzą dużej skuteczności tego schematu leczenia przy stosunkowo niskich kosztach oraz większej skuteczności leczenia zakażeń spowodowanych przez *Helicobacter pylori* u osób w młodszym wieku.