Bariatric surgery is currently the only effective treatment option for morbidly obese patients. There has been observed a considerable disproportion between the number of procedures conducted in Poland and the number of patients requiring such treatment. There are no studies assessing bariatric knowledge among general practitioners who play a crucial role in the Polish healthcare system.

The aim of the study was to assess the knowledge of general practitioners regarding bariatric surgery.

Material and methods. An anonymous questionnaire conducted among 282 general practitioners in 2010-2011 during local educational conferences. The questionnaire consisted of 10 questions relating to fundamental issues of bariatric surgery.

Results. Only one-twelfth (8.1%) of the general practitioners questioned knows the indications for bariatric surgery, can apply them, and has epidemiological awareness. 61.5% of general practitioners know the surgical procedures used for the treatment of obesity, whereas 58% of them show knowledge of surgical technique in which they are performed. Only 23% of general practitioners were aware that bariatric surgery decreases cancer risk. 92% of the participants noticed a necessity of education regarding the surgical treatment of obesity.

Conclusions. Bariatric knowledge among general practitioners is not adequate to scientific research results published during the last years. Most general practitioners who participated in our study are aware of that and are awaiting for educational programmes focused on this issue.

Key words: bariatric surgery, general practitioners.
litus, arterial hypertension, dyslipidemia, and others. Epidemiological studies conducted several years ago in our country determined that overweight patients constitute nearly 50% of the society, while obesity concerns approximately 20% (2, 3). The BMI exceeding 35 was observed in 5% of the general population, while above 40 in 1% (4). Obesity plays a key role in the pathophysiology of many metabolic diseases and increases the cardiovascular risk (5).

The epidemiological study conducted in the United States on a group of 100 thousand subjects showed that the risk of type 2 diabetes mellitus in patients with the BMI exceeding > 35 is 30-40 times higher, as compared to patients with the BMI < 22 (6). The close relationship between obesity and diabetes was confirmed by the fact that amongst patients with type 2 diabetes mellitus, nearly 90% were overweight (7). The Framingham study demonstrated that in 70% of male and 61% of female patients arterial hypertension was directly associated with obesity, and each 5 kg weight gain was accompanied by a 4.5 mm Hg increase in systolic pressure (8).

Obesity is not only accompanied by significant health problems, but also economic consequences, which affect the health care systems of different countries. Numerous conditions coexisting with obesity, such as type 2 diabetes mellitus, cardiovascular diseases, arterial hypertension, lipid disorders lead towards the development of the metabolic syndrome. Additionally, coexisting arthritis, hormonal disturbances, infertility, and other conditions, absorb, depending on the country, 3 to 6% of the costs allocated to the health care system (9, 10). The estimated costs for the treatment of patients with excessive body weight are 10% higher, as compared to normal weight patients, and 36% higher in case of subjects suffering from obesity (11).

Obesity is also a risk factor for certain tumors, such as colon and prostate cancer in men, and breast, ovarian and uterine cancer in women. The consequences of obesity are also social costs, including sickness absence, disability and family expenses (medication costs and difficulties in finding a job). Considering the reduction of these costs an important role is played by the primary and secondary prevention of obesity and its effective treatment.

It is commonly believed that the treatment of obesity includes lifestyle modification, a change in dietary habits, increased physical activity, and pharmacological treatment. However, lack of effectiveness of the above-mentioned methods, as well as their short-term effect in case of patients with significant obesity were the reason for the birth of bariatric surgery.

As previously mentioned, patients with the BMI exceeding 40 or those with the BMI exceeding 35 with coexisting diseases, such as type 2 diabetes mellitus, arterial hypertension, and lipid disorders were qualified for surgical intervention (12).

There are three types of operations:
1. Restrictive operations – limiting the intake of food:
   - Vertical Banded Gastroplasty (VGB),
   - Adjustable Gastric Banding (AGB),
   - Sleeve Gastroctomy (SG).
2. Operations excluding the continuity of the alimentary tract from digestion:
   - Bilio-Pancreatic Diversion (BPD),
   - Duodenal Switch (DS).
3. Restrictive-diversion operations:
   - Roux-Y Gastric By-pass (RYGB).

The introduction of laparoscopic techniques allowed to increase safety and reduce the number of perioperative injuries, enabling faster return to physical and social activities (13). The benefits associated with surgical treatment are not only limited to weight reduction. Numerous study results showed reduced risk of death in patients subject to surgical treatment, as compared to patients subject to conservative therapy (14-18). The effect of treating obesity also leads to the less frequent development of malignant neoplasms, such as esophageal, colon, and pancreatic adenocarcinomas, kidney, uterine, liver and gallbladder cancer, lymphomas, and post-menopausal breast cancer (obesity-related carcinomas) (19, 20, 21).

Such pleiotropic influence of bariatric surgery leads towards the reduction of health care system costs by decreasing expenditures for the treatment of coexisting diseases, where therapy is chronic and ineffective (22, 23, 24).

Considering the above-mentioned, the prevalence of obesity in the society, which takes the nature of an epidemic, the lack of modern ability for effective conservative therapy, and the favorable effect of treating obesity and its complications by means of surgery, raises the follow-
Assessment of the knowledge of GPS considering the surgical treatment of obesity

The study was conducted between 2010 and 2011 during local educational conferences for physicians, considering different subjects, including those devoted to obesity and its treatment. In such cases filled out questionnaires were collected before the start of the lectures. The survey was also available on the website and information was sent to the Consultants and Presidents of Medical Societies. In total, 778 questionnaires were obtained including 283 filled out by family physicians (GPs). The survey was anonymous, consisting of 10 questions concerning basic issues associated with

### MATERIAL AND METHODS

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<table>
<thead>
<tr>
<th>Questionnaire concerning surgical treatment of obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Wskazaniem do chirurgicznego leczenia otyłości jest:</strong></td>
</tr>
<tr>
<td>A. występowanie chorób towarzyszących otyłości przy masie ciała dwukrotnie większej od prawidłowej;</td>
</tr>
<tr>
<td>B. występowanie chorób towarzyszących otyłości przy wskaźniku masy ciała powyżej 35;</td>
</tr>
<tr>
<td>C. występowanie chorób towarzyszących otyłości przy masie ciała większej o 40 kg od prawidłowej;</td>
</tr>
<tr>
<td>D. żadna z powyższych odpowiedzi nie jest prawidłowa;</td>
</tr>
<tr>
<td><strong>2. Do praktyki lekarza rodzinnego zgłosił się:</strong></td>
</tr>
<tr>
<td>A. mężczyzna chorujący na cukrzycę typu 2 o wzroście 200 cm i masie ciała 141 kg oraz kobieta chorująca na nadciśnienie o wzroście 150 cm i masie 80 kg. Leczenie operacyjne należy rozważyć si:</td>
</tr>
<tr>
<td>B. kobiety;</td>
</tr>
<tr>
<td>C. mężczyzn i kobiety;</td>
</tr>
<tr>
<td>D. żadnego z powyższych chorych.</td>
</tr>
<tr>
<td><strong>3. Zakładając, że w typowej praktyce lekarza rodzinnego znajduje się pod opieką 2500 pacjentów, to do chirurgicznego leczenia otyłości powinno zostać skierowanych (wybierz odpowiedź najbardziej prawdopodobną w świetle wyników badań epidemiologicznych przeprowadzonych w naszym kraju):</strong></td>
</tr>
<tr>
<td>A. 1 chory;</td>
</tr>
<tr>
<td>B. 10 chorych;</td>
</tr>
<tr>
<td>C. 100 chorych;</td>
</tr>
<tr>
<td>D. 1000 chorych;</td>
</tr>
<tr>
<td><strong>4. Chirurgiczne leczenie otyłości polega na:</strong></td>
</tr>
<tr>
<td>A. ograniczeniu możliwości spożywania pokarmów lub ich trawienia i wchłaniania poprzez operację na żołądku i jelitach;</td>
</tr>
<tr>
<td>B. wycięciu nadmiaru tkanki tłuszczowej wewnątrzbrzusznej, a w szczególności sieci;</td>
</tr>
<tr>
<td>C. wycięciu nadmiaru tkanki tłuszczowej podskórnej w obrębie brzucha i kończyn dolnych z jej zachowaniem w obrębie klatki piersiowej;</td>
</tr>
<tr>
<td>D. wprowadzeniu do żołądku balonu wypełnionego roztworem beku trytonu lub powietrzem, ograniczającego spożycie pokarmów.</td>
</tr>
<tr>
<td><strong>5. Któża technik stanowi w świetle współczesnej wiedzy najbezpieczniejszy sposób przeprowadzenia operacji w celu leczenia otyłości?</strong></td>
</tr>
<tr>
<td>A. klasyczna laparatomia - szerokie otwarcie jamy brzusznej umożliwiające dokładny wgląd do jamy brzusznej;</td>
</tr>
<tr>
<td>B. laparoskopowa: technika minimalizacyjna nazwana również „operacja przez dżiczkę od kłucza”;</td>
</tr>
<tr>
<td>C. endoskopowa: pozwalająca na dostęp do jamy brzusznej przez naturalne otwory ciała, takie jak: ustę, odbytnica, pochwa;</td>
</tr>
<tr>
<td>D. żadna z powyższych odpowiedzi nie jest prawidłowa.</td>
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</tbody>
</table>
surgical management of obesity (questionnaire). The first three questions were directed to assess the knowledge concerning surgical treatment indications: question 1 tested the theoretical knowledge, question 2 the ability to use that knowledge in practice, and question 3 evaluated the ‘epidemiological consciousness’ of the physician- how often do you come across this problem in your practice? Questions 4 and 5 evaluated the knowledge of the physician concerning therapeutic methods and operative techniques. Questions 6, 7, and 9 referred to treatment results and their impact on health care costs in these patients. Question 8 concerning the word “bariatrics” might seem unjustified, however, two or three years ago the mentioned term was completely foreign to the medical environment. Question 10 concerned the assessment of the environmental interest to the knowledge in this field.

RESULTS

Table 1 presented the obtained results. The study demonstrated that more than half of GPs (53%) present with theoretical knowledge concerning indications for surgical treatment of obesity. Question 2 showed that only 39% of physicians can use this knowledge practically. While the so-called “epidemiological consciousness” of the risk of obesity, was observed in only 17% of respondents. The overview of the accuracy of provided answers to the first three questions enabled to determine the group of physicians possessing theoretical, practical and „epidemiological consciousness” knowledge, which conditions proper therapeutic decisions considering patient care. The abovementioned represent a total of 8.1% of respondents (fig. 1). Proper knowledge of the surgical techniques used in the treatment of obesity was possessed by 61.5% of respondents.

It should be noted that in case of 39% of physicians the only known surgical technique of treating obesity is the gastric balloon implantation method (fig. 2). The correct answer to question 5 was granted by 58% of GPs. A surprising result was noted in case of 29% of physicians who considered endoscopy to be the most appropriate method used in case of bariatric surgery (fig. 3). The comparison of responses obtained to questions 4 and 5 shows that of 101 respondents for whom the only known method of surgical treatment of obesity is gastric balloon implantation, 53% marked answer C in response to question 5, probably being suggested by the word endoscopy, without getting acquainted with or understanding the described NOTES technique.
In total, 215 (76%) physicians responded in accordance with published scientific study results concerning the benefits of bariatric treatment. However, 44 (15%) of the investigated respondents falsely believe that prolonged life is connected with a decrease in its quality (fig. 4). In question 7 only 23% of the respondents demonstrated proper knowledge considering the beneficial effects of bariatric surgery on the occurrence of malignant tumors in obese patients (fig. 5). Considering the investigated group nearly 83% are familiar with the term “bariatriy”, as a discipline dealing with the treatment of obesity. 204 (72%) physicians are aware of the fact that surgical treatment of obesity reduces health care costs. Nearly 92% of the respondents see the need for education, considering surgical treatment of obesity (fig. 6). However, it is worth noting that a selected number of physicians consider their knowledge as satisfactory or declare the need for education: 46 subjects (answers A, and B in question 10). Analysis of their responses demonstrated that only 8 (17%) of them can properly identify and qualify obese patients for surgical treatment (correct answers to questions 1, 2 and 3).

**DISCUSSION**

The increasing problem of obesity and related multiple consequences impose on the health care system the need to modify management, aimed at reducing the adverse effects associated with obesity. In Poland, primary care...
of patients with high BMI is exercised by a GP, who, based on our research, does not possess proper knowledge concerning effective therapeutic methods. Considering literature data there are no sufficient studies of primary care physicians in the field of bariatric surgery.

In a French survey (25) only 42% of GPs declared good knowledge considering treatment of obese patients. However, 32% were convinced that the above-mentioned was possible, due to conservative treatment. More than 50% of our respondents were able to qualify patients for proper treatment, which only in half of cases translated into practical skills, and even to a lesser extent, considering the epidemiological awareness of the physicians. An unquestionable limitation of our study and the obtained results is the random and relatively small patient group. Considering the lack of possibility to perform the study on a larger population of GPs the observed trend provides valuable information. Assessment of the knowledge regarding surgical methods revealed yet another troubling trend concerning the choice of the endoscopic method, considering treatment. Currently, the temporary endoscopic introduction of the gastric balloon is considered merely as the preparation before the surgical procedure, and not as definitive treatment (26, 27). The obtained results are evidence that the choice of the response is associated with the lack of understanding, which might result from information provided by non-medical literature. Additionally, the excessive use of the term “endoscopic method”, resulting from the misunderstanding of the method, lead to the selection of the NOTES technique (53% of respondents), which is currently undergoing clinical trials. The choice of laparoscopy as the standard surgical method by only 58% of respondents is hard to explain from the perspective of many years of experience of surgeons, considering other procedures (cholecystectomy for example). In case of the bariatric surgeon the method is intuitively selected, given the excellent insight into the operative field, and based on research results, reduction of intra- and postoperative complications (28). Thus, why do GPs who take care of patients during the postoperative period, seeing the benefits of laparoscopy do not propose the above-mentioned to patients suffering from obesity? The question remains unanswered.

Our questionnaire also revealed the sad fact that more than 70% of GPs did not perceive bariatric procedures, as methods which apart from reducing weight, additionally reduce the risk of cancer development (marked answers A, C, D). Lack of this knowledge not only puts obese patients at greater risk of cancer development (tumors dependent of obesity), but also could be the reason for future patient and family member claims associated with “no due diligence” in the field of preventive oncology. Although our results are based on a relatively narrow section of surgery, it is possible that the level of ignorance demonstrated by GPs in the field of bariatric surgery may also refer to other fields of surgery (thyroid, hernias, vascular and oncological surgery). In consequence, this might influence the health safety of our population and possibly explains why one may encounter very advanced disease cases, where surgical treatment is difficult, being burdened with significant risk, if not impossible. We believe that our study results should have significant impact on the surgical environment, pointing to the need to intensify educational activities directed to the GP environment, for the good of our patients.

**CONCLUSIONS**

Study results demonstrated that the knowledge of GPs in the surgical treatment of obesity is negligible. Available theoretical information in the field of bariatry to a small extent translate into the ability to identify and qualify patients for surgical procedures. Most GPs are interested in broadening their knowledge in the above-mentioned field.
Częstość występowania nadwagi i otyłości u kobiet i mężczyzn w wieku 20-74 lat. Wyniki programu


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