BARIATRIC SURGERY IN MORBIDLY OBESE PATIENTS WITH CHRONIC RENAL FAILURE, PREPARED FOR KIDNEY TRANSPLANTATION – CASE REPORTS

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Recent years, obesity is a growing health problem also in patients with chronic renal failure and end it’s end stage. This situation has a negative impact both on the extension of the waiting period for transplantation, and the survival rate of the transplanted organ and the recipient. Weight loss through lifestyle modification before transplantation is ambiguous. Its well known fact of rapid body mass gain after transplantation, and finally the results of transplantation are not better than those of patients who have not reduced body weight.

The paper presents preliminary experience associated with bariatric operations of three chronic di-alysed patients with morbid obesity BMI> 35 kg/m², all patients had been treated by Roux-en-Y gastric by-pass (RYGB). All operated patients were classified as potential recipients were listed by Pols-transplant. One of them three months after RYGB surgery underwent without complications a renal transplantation. Preliminary experiences based on operating these three cases confirmed the complete safety of this type of approach in patients with end-stage chronic kidney disease (CKD).

Key words: chronic kidney disease, kidney transplant, morbid obesity, Roux-en-Y gastric by-pass (RYGB)

Obesity in the group of patients with chronic renal failure (CRF) may preclude access to kidney transplantation. Weight loss surgery has demonstrated effectiveness in the treatment of obesity but also diabetes, and hypertension; both of which are noted to be primary causes of chronic kidney disease. Obesity has been associated with poor graft and patient survival after kidney transplantation requiring significant increase of anti-rejection drugs (1). Bariatric surgery is becoming more recognized as a treatment option either to help to diminish progression of chronic kidney disease or to prepare patients for kidney transplantation if weight loss is needed to qualify for transplant candidacy (2). Safety and efficacy of bariatric surgery in patients with kidney failure was confirmed with most common procedure Roux-en-Y by-pass (RYGB). Bariatric surgery seems an interesting option for improving outcomes before and after kidney transplantation (3). We present the first experience of our centre based on a series of three morbidly obese patients BMI >35 kg/m² with chronic kidney disease being prepared for kidney transplantation with bariatric surgery. Two of patients had diabetic nephropathy, one hypertensive nephropathy. All of them underwent RYGB in the period January-May 2012.

All patients were operated and then qualified as a potential recipients on the list of Pols-transplant. One of them 3 months ago underwent uncomplicated kidney transplantation. In all cases we observed improvement in metabolic parameters, including regression of type 2 diabetes, and hypertension.

Results of the 3 operated patients at our institution confirmed a full safety procedure in patients with CRF.
CASE REPORTS

Between January and May 2012, three patients on chronic dialysis therapy underwent a bariatric surgery procedure to improve their metabolic status and improve their chances of successful renal transplantation procedure.

All patients with BMI > 35 kg/m² had previously undertaken unsuccessful attempts of dietary treatment. Following nephrology and surgery consultation, they were enrolled to the preparatory program for the bariatric treatment. All patients were qualified to RYGB procedure.

The first operated patient, aged 61, BMI 40.5 kg/m², with type 2 diabetes mellitus, hypertension, hyperlipidemia, stable coronary artery disease, was on chronic dialysis therapy for 2 years due to renal failure caused by diabetic nephropathy.

The second operated patient, a 49-year-old woman, BMI 42.1 kg/m², with type 2 diabetes mellitus and hypertension, was on chronic dialysis therapy for 3 years due to renal failure caused by diabetic nephropathy.

The last of the patients operated in the Department was a woman with chronic renal failure caused by uncontrolled hypertension.

Two patients underwent laparoscopic procedures (LRYGB), and one patient, due to a history of abdominal surgery procedures, underwent classical procedure. A RYGB procedure was performed in an conventional manner: gastric pouches had a volume of 50-70 ml, intestinal loops: biliary-pancreatic 80-100 cm, alimentary 120-130 cm. No complications were recorded during the surgical procedure or during the early and late postoperative period.

All operated patients attended follow-up visits one month and 3 months after the surgical procedure. Only one month after the LRYGB procedure, the first patient reported that duration of his dialysis performed every other day, was shorter by 25 minutes. Furthermore improvement of renal indices was noted and urea level was 24.8 mg/dl, while the corresponding level was 110 mg/dl before the LRYGB procedure (levels measured after the dialysis therapy). Other renal indices after the bariatric therapy were as follows: creatinine 7.6 mg/dl, eGFR 5 ml/min/1.73 m². Blood glucose concentration also normalized, which resulted in complete insulin discontinuation; 3 month after the procedure, HbA1c was 5.7%.

The second patient, also with type 2 diabetes mellitus, 2 months after the surgical treatment had blood glucose concentrations that enabled reduction of insulin dose from 80 units daily to 10 units daily, while HbA1c level was 6.1% six months after the RYGB procedure. The dialysis duration did not change significantly, but serum uric acid concentration was reduced from 47.9 mg/dl before the RYGB procedure (levels measured after the dialysis session), while the other parameters were as follows: creatinine 5.3 mg/dl and eGFR 6 ml/min/1.73 m² and did not change significantly versus values measured before the bariatric surgery procedure.

In the last case, one month after the LRYGB procedure and with loss of 13 kg of body weight, arterial blood pressure that had been difficult to control with pharmacotherapy, was normalized. This allowed for marked reduction of doses of antihypertensive medications. In the initial postoperative period, adjustment of hemodialysis parameters to relatively rapid body weight reduction was a problem. Inadequate downtitration of antihypertensive medications resulted in a hypotension episode that resulted in a mild head injury. Renal parameters assessed immediately after the dialysis, were similar as before the bariatric treatment.

Furthermore, these patients were subjected to detailed care by the attending dietician as early as immediately after the surgical procedure in view of the need for proper supplementation of calories and protein. Supply of the latter was at least of 1 g/kg of predicted body weight/24 hours, caloric intake was 35 kcal/kg predicted body weight/24 hours. Subsequent follow-up visits in this group of patients were conducted according to the following schedule: 6, 12 months after the procedure and then annually; furthermore these patients must attend periodic monitoring visits and nephrological treatment visits.

All patients were successfully consulted by transplantologists and were included on the Poltransplant list of potential transplant recipients. One of the reported patients underwent a successful kidney transplantation procedure 3 months earlier, therefore within 6 months of surgical treatment of obesity. No
Table 1. Characteristics of patients with renal failure, qualified to bariatric treatment

<table>
<thead>
<tr>
<th>No.</th>
<th>Age</th>
<th>Sex</th>
<th>BMI before (kg/m²)</th>
<th>BMI 1 month after (kg/m²)</th>
<th>BMI 3 months after (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>61</td>
<td>M</td>
<td>40,5</td>
<td>35,8</td>
<td>30,6</td>
</tr>
<tr>
<td>2</td>
<td>49</td>
<td>K</td>
<td>42,1</td>
<td>38,4</td>
<td>34,3</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>K</td>
<td>37,0</td>
<td>32,1</td>
<td>28,5</td>
</tr>
</tbody>
</table>

Table 2. Characteristics of disorders in the group of patients on chronic dialysis therapy, who underwent bariatric surgery procedures

<table>
<thead>
<tr>
<th>No.</th>
<th>Co-morbidities</th>
<th>Duration of CRF (years)</th>
<th>Dialysis therapy (years)</th>
<th>Type of nephrectomy</th>
<th>List of Poltransplant recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>metabolic syndrome</td>
<td>5,5</td>
<td>2</td>
<td>diabetic nephropathy</td>
<td>yes</td>
</tr>
<tr>
<td>2</td>
<td>DM2, HA</td>
<td>5</td>
<td>3</td>
<td>diabetic nephropathy</td>
<td>yes</td>
</tr>
<tr>
<td>3</td>
<td>HA, POChP / HA, COLD</td>
<td>7</td>
<td>2</td>
<td>hypertensive nephropathy</td>
<td>yes</td>
</tr>
</tbody>
</table>

perioperative or delayed complications were found in this patient.

DISCUSSION

Over the recent years a worryingly rapid increase of incidence of chronic kidney disease accompanied by a concurrent epidemics of obesity has been observed. Studies have demonstrated that obesity significantly (by as much as 7-fold) increases the risk of chronic kidney disease versus population without overweight or obesity. Effect of metabolic syndrome on pathogenesis of cardiovascular complications was confirmed by multiple clinical trials. However, its effect on development of renal pathology seems underestimated (4). Morbid obesity is associated with pronounced renal impairment resulting from adverse effects of factors related to hypertension, oxidative stress of inflammation. Another important issue is the fact that obese patients (BMI> 35 kg/m²) with end-stage renal failure have lower chance of being recipients of kidney transplant, since in this group the risk of complications, in particular cardiovascular complications and death after the transplantation procedure, is significantly higher than in on-obese recipients (4, 5).

Poltrnasplant data indicates that an average waiting time for a transplant in Poland from the onset of dialysis therapy is 2 years and 8 months, and since inclusion in the National Waiting List (NWL) – only 7 months; this indicates that the qualification for the transplantation itself lasts for approximately 2 years. Despite all objective difficulties, this is clearly too long, since each year of dialysis therapy results in worse diagnosis after the transplantation procedure itself (6). For the sake of comparison, according to a study conducted by John Hopkins in a group of obese patients, an average waiting time for the kidney transplant is by 5 years longer than in a group of non-obese patients. This data also indicates that these patients have an overall by 44-fold lower chance of being a recipient of the kidney transplant, and 8% of them die before receiving a kidney transplant (7). Morbid obesity is not an absolute contraindication to the transplantation, and the decision is up to an experienced transplantation institution. In Poland some institutions have adopted an upper BMI limit of 30 kg/m², while other 35 kg/m² (6).

Dietary treatment and attempts to reduce body weight by changing a life style are most commonly unsuccessful and markedly prolong the waiting time for the transplant. The literature data also indicates that after the transplantation patients rapidly regain their body weight, and results of treatment are comparable to that obtained in a group of patients who did not reduce their body weight before the transplantation procedure (8).

The requirement of body weight reduction before the transplantation procedure continues to be a matter of controversy, however attempts to reduce body weight in patients with BMI > 40 kg/m², even with surgical methods, are unquestioned (9).

Literature data on this issue are also equivocal, however some of them, in particular those collected over the recent years, suggest that obesity does not have adverse effect on
Patient and graft survival, however, is associated with higher comorbidity rate, in particular cardiovascular comorbidity or infective complications. Despite of that, survival of obese patients after the transplantation is believed to be better than in obese patients on chronic dialysis therapy (10, 11).

However, clearly the surgical procedure of the kidney transplantation in a group of morbidly obese patients carries higher risk of surgical complications and prolonged procedural time as well as duration of hospitalization as compared to the group with normal body weight (5).

Furthermore, in a group of obese patients with CRF subjected to bariatric treatment, renal function parameters (GFR and creatinine clearance – 24 CCL) were found to be improved, and in a group of morbidly obese diabetic patients who underwent RYGB procedure, albuminuria reduction was also found that additionally correlated with improvement of tissue sensitivity to insulin and increased concentration of high molecular adiponectin (12, 13).

Literature also reports cases of patients who first underwent kidney transplantation, and then were subjected to bariatric surgery; no adverse effects of the surgical procedure on the graft survival or requirement to increase immunosuppressant doses was found (2). However, treatment of obesity first and then kidney transplantation seems to be more adequate strategy. This sequence of management results in body weight reduction and improvement of metabolic parameters that have a clearly positive effect on reduction of possible complications of the surgical procedure as well as prolongation of survival time of the graft.

Available literature, including papers that are metaanalyses based on studies of large groups of patients, prove that bariatric surgery is successful in the group of patients with chronic renal failure as part of preparations to the transplantation (14). These studies also confirm complete safety of such management in this group of patients where both postoperative complications and peri- and postoperative mortality was comparable to that in bariatric patients without chronic renal failure (15).

It seems that BMI < 35 kg/m² should be accepted by transplantation institutions in Poland when qualifying patients as potential recipients; higher degree of obesity requires more detailed assessment and individual decision.

Lack of clear standards in our country as well as common acknowledgement of such therapy in this group of patients makes such management very rare. This notion is supported by the fact that during this at our institution 1000 received the renal transplant, while only 3 patients underwent preliminary therapy of treatment of morbid obesity. We hope that the current year, a year after commencement of bariatric surgery in this group of patients, could witness a breakthrough.

REFERENCES