QUALITY OF LIFE CONSIDERING PATIENTS WITH CHRONIC INFLAMMATORY BOWEL DISEASES – NATURAL AND PARENTERAL NUTRITION

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One of the elements of treatment considering inflammatory bowel diseases is nutritional therapy. The duration of the above-mentioned depends on the prevalence of such symptoms as fever, bowel movements, length of the functioning gastrointestinal tract, stoma and intestinal fistula presence. Nutritional therapy is an essential element of successful treatment alongside pharmacological, surgical, and biological therapy, as well as other methods. Crohn’s disease and ulcerative colitis considered as chronic diseases, lead towards physical and biopsychosocial disability, being responsible for the reduction in the quality of life.

The aim of the study was to determine the quality of life after surgical procedures in case of patients diagnosed with Crohn’s disease and ulcerative colitis, subjected to natural and parenteral nutrition.

Material and methods. The study group comprised 52 patients from the Department of Gastroenterology, Military Medical Institute, and Department of Surgery and Clinical Nutrition, Clinical Hospital in Warsaw. The study was performed between October, 2011 and April, 2012. The World Health Organization Quality of Life Instrument – Bref (WHOQOL–BREF) questionnaire was used to determine the patients’ quality of life.

Conclusions. A lower quality of life was observed in case of patients subjected to parenteral nutrition, poor education, disease symptoms exacerbation, in the majority- rural inhabitants. The quality of life does not depend on gender, type of disease, family status, and additional medical care.

Key words: Crohn’s disease, ulcerative colitis, quality of life

Inflammatory bowel diseases (IBD) are idiopathic, chronic diseases of the gastrointestinal tract characterized by episodes of relapse and remission. Ulcerative colitis is a diffuse, non-specific inflammatory process comprising the mucosa and submucosa of the colon. The developing chronic inflammatory lesions are usually located in the rectum extending towards the proximal segments of the bowel. The disease is observed in the rectum and colon, possibly leading to ulcerations, fistula development and intestinal occlusion. In 80% of cases inflammation concerns the distal segment of the colon, while in the remaining 20% the colon.

Crohn’s disease is a chronic, segmental, asymmetrical inflammation comprising all layers (transmural) of the gastrointestinal tract, often of granulomatous character. Focal lesions are observed in the sigmoid, small and large bowels. Patients are often diagnosed with perianal lesions, their presence...
observed in 35-45% of cases. These lesions are less commonly observed in the proximal part of the small bowel, rarely in the appendix and upper gastrointestinal tract. Segmental inflammation consists in the presence of focal lesions, separated by histopathologically disease-free intestinal segments. During the course of the disease one may observe intestinal occlusion, abscess development and fistula presence between neighbouring intestinal loops, other organs or abdominal integuments. Malnutrition in case of severe Crohn’s disease is observed in 25-80% of patients. Approximately, 20% are diagnosed with “kwashiorkor” type malnutrition, characterized by significant serum protein level reduction (albumins and short half-life proteins), decreased cellular immunity, edema, and electrolyte balance disturbances. Malnutrition in case of Crohn’s disease develops in consequence of loss of appetite, nausea and vomiting, diarrhea, digestion and absorption disturbances, loss of proteins to the intestinal lumen, increased energy expenditure. Diarrhea during the acute phase of inflammatory diseases leads to water loss and thus, dehydration and loss of multiple minerals and nutrients. Fatty diarrhea increases the risk of oxalate kidney stones. In each case of acute inflammatory bowel relapse one may observe an increased demand of energy, nutritional elements and active substances (1, 2, 3).

Even the smallest amount of food contributes to the activation of biliary secretion, digestive enzymes and intestinal peristalsis. Nutritional treatment of inflammatory bowel diseases consists in the following (2, 4):

- elementary diet – the preparations contain elements subjected to digestive processing that enable to obtain easily digestible particles (aminoacids, peptides, MCT, disaccharides, oligosaccharides, monosaccharides); they have no fiber, are easily absorbed and properly balanced;
- peptide diet (half-elementary) – the preparations contain elements subjected too initial digestive processing (peptides, LCT, MCT, polysaccharides, oligosaccharides); they have no fiber, are easily absorbed and properly balanced;
- polymeric diet – the preparations contain long-chain, natural, undigested proteins (milk, meat, soya proteins, complex carbohydrates and fats – MCT, LCT), being well-balanced, covering the total dialy nutritional demand, most do not contain fiber and have a pleasant taste.

Parenteral nutrition in case of patients with inflammatory bowel diseases is used in case of contraindications or enteral nutrition intolerance in case of patients with severe malnutrition, during the acute inflammatory phase, or preoperative period (2). Parenteral nutrition leads to decreased metabolic activity, reduced intestinal peristalsis, and thus, unfavorable changes considering hormonal and intestinal trophic factors (4). Modern parenteral nutrition should be carried out according to the all-in-one method, and adjusted to the current clinical condition of the patient (2). Parenteral nutrition is a significant element of treatment, often life-saving, and should be implemented each time required, although enteral nutrition should be re-introduced as soon as possible, being more physiological, safer, and cheaper (3). Nutritional therapy is a significant element of successful management alongside effective pharmacological and surgical therapy, as well as other adjuvant therapeutic methods (5).

Quality of life is a multidimensional concept, being ambiguously defined and differently assessed. Defining the above-mentioned is difficult and complex, since every human being, individually and subjectively, determines the quality of life, according to his/her personality and environmental conditions. The concept should be considered in terms of health. According to the definition of the World Health Organisation (WHO), as not only the absence of the disease, but also the social, psychological and physical well-being, when speaking of health, one may specify the value by which the person or group of people can fulfill their aspirations and the need to generate satisfaction, as well as change the environment. Thus, quality of life is determined by the patients’ physical and psychological condition, social relations, degree of independence and relationship to significant environmental issues. A man’s life changes when he is suffering from a chronic disease, his condition deteriorating all aspects of normal functioning.

In medicine, the concept of quality of life occurs in the context of medical research and health-related disease consequences, as well as when assessing medical and non-medical care and treatment. It is situated in the con-
cept of holistic medicine, responsible for the whole patient, not only extending his life (biological sense) but also making him more active, making therapeutic efforts to ensure optimal future activity. The quality of life is determined by the difference between the expected and actual situation. Quality of life is a subjective feeling of satisfaction experienced by the human being affecting all the spheres of life. Deterioration of the patients’ condition, reduced mobility, inevitably worsen the patients’ quality of life. Their is an increased distance between the expected and actual patients’ condition. More and more time is devoted to the quality of life, dependent of the health condition, as the above-mentioned may be influenced by therapy and education. The recognition of the patients’ assessment of his own health is an important element in the process of treatment and care, and the subjective quality of life should be determined on the basis of standard scientific methods. Knowledge of the problem allows to carry out proper health actions considering patients’ of all ages (6, 7).

The aim of the study

Quality of life in case of patients diagnosed with inflammatory bowel diseases, including the following aspects:
- physical – everyday activities, dependent of treatment, energy and fatigue, pain and discomfort, rest and sleep, as well as earning possibilities;
- psychological – relating to the external appearance, negative and positive feelings, self-esteem, personal faith, focus and concentration;
- social relations – influence of the current condition on personal relationships, social support and sexual activity;
- environmental – concerning financial possibilities, safety, medical care availability, housing conditions, recreational, rest, and migration possibilities.

MATERIAL AND METHODS

The presented study is based on the questionnaire method. The study group comprised patients (n= 52) diagnosed with Crohn’s disease (n=41) or ulcerative colitis (n= 11), subjected to enteral (n=33) or parenteral nutrition (n= 19). Average patient age amounted to M= 34 years. The study group comprised 30 male and 22 female patients. Table 1 presented patient characteristics.

Statistical analysis was based on the non-parametric t-Student equivalent test for independent groups – U Mann Whitne’y test, and the non-parametric Kruskal-Wallis equivalent test.

The presented values are average results and standard deviations (M±SD). All patients were from the Department of Gastroenterology, Military Medical Institute in Warsaw, and Department of General Surgery and Clinical Nutrition, Medical University in Warsaw. The study was undertaken in both centers. The World Health Organization Quality of Life Instrument – Bref (WHOQOL–BREF) questionnaire was used for assessment.

RESULTS

Differences in the quality of life of patients with non-specific inflammatory bowel diseases, depending on nutrition

The study group comprised two groups: those subjected to enteral and parenteral nutrition.

U Mann Whitne’y test analysis showed significant differences in patients subjected to

Table 1. Group characteristics

<table>
<thead>
<tr>
<th>Type of disease</th>
<th>Condition</th>
<th>Nutrition</th>
<th>Education</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crohn’s disease</td>
<td>ulcerative colitis</td>
<td>remission</td>
<td>relapse</td>
<td>natural</td>
</tr>
<tr>
<td>n</td>
<td>41</td>
<td>11</td>
<td>39</td>
<td>13</td>
</tr>
</tbody>
</table>
parenteral and enteral nutrition, considering the psychological quality of life (U= 173.5; p= 0.007).

Patients subjected to enteral nutrition achieved higher scores on the psychological well-being scale (68.1 ±17.5), as compared to those on parenteral nutrition (56.9 ±10.9).

Analysis showed insignificant differences between both groups considering the social scale (U= 157; p= 0.003).

Parenteral nutrition obtained lower values (56.6 ± 20.1), as compared to enteral nutrition (72.9 ±17.5).

Differences were also observed in case of physical satisfaction (U= 219; p= 0.071). Patients on enteral nutrition obtained higher scores (65.5 ±21.8), as compared to parenteral nutrition (56.8 ±10.8). No significant differences were observed between both groups, considering the environmental index.

Table 2 presented the exact distribution medium, considering various aspects of quality of life, depending on nutrition.

The above-mentioned results are evidence that nutrition in case of non-specific inflammatory bowel diseases has a statistically significant impact on the quality of life in the physical and psychological aspects, and social relations.

Differences in the quality of life considering patients with non-specific inflammatory bowel diseases, depending on their education

Analysis included three groups, according to the patients’ declarations-those with vocational, secondary, and higher education.

Analysis by means of the non-parametric Kruskal- Wallis test showed differences between above-mentioned groups, depending on education, in the field of psychology (chi²(2)= 15.1; p= 0.001). It turns out that patients with vocational education (M= 50.5, SD=15.5) significantly differ from those with secondary education (64.4 ±17.5) (U= 87; p=0.02), as well as higher education (75.8 ±16.7) (U= 18; p= 0.0001).

Analyses also show differences (in case of tendency) between secondary and higher education, considering the psychological aspect (U=110.5; p= 0.064). Patients with higher education obtain highest results, while those with vocational-lowest. Analysis showed differences depending on education (chi²(2)= 11.6; p= 0.003). It turns out that patients with vocational education (53.1 ±14), significantly differ from those with secondary (64.4 ±17.5) (U=82; p=0.013) and higher education (77.6 ±18.3) (U=33; p=0.001).

The figure below shows differences between average quality of life indices, depending on education. No differences were observed, considering the environmental index.

Differences in the quality of life considering patients with non-specific inflammatory bowel diseases, depending on the stage of the disease (remission vs. exacerbation).

Analysis by means of the non-parametric U- Mann Whitney test showed differences between subjects in remission and during relapse, considering the physical (U= 78.5; p= 0.0001) and environmental (U=78; p=0.001) indices. Analysis also showed differences considering the psychological aspect (U=100; p= 0.053). It turns out that patients in remission obtained higher quality of life scale results, as compared to those during relapse. Table 3 presented mean quality of life values, depending on the actual condition of the patient.

There were no group differences in case of „relation”.

Table 2. Mean values for various aspects of quality of life, depending on nutrition

<table>
<thead>
<tr>
<th>SNutrition</th>
<th>Natural (enteral) M (SD)</th>
<th>Parenteral M (SD)</th>
<th>U Mann Whitne'y</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical aspect</td>
<td>65.5 (21.8)</td>
<td>56.9 (10.9)</td>
<td>219</td>
<td>0.071</td>
</tr>
<tr>
<td>Psychological aspect</td>
<td>68.1 (17.5)</td>
<td>56.7 (14.4)</td>
<td>173.5</td>
<td>0.007</td>
</tr>
<tr>
<td>Relations</td>
<td>72.9 (16.4)</td>
<td>56.6 (20.1)</td>
<td>157</td>
<td>0.003</td>
</tr>
<tr>
<td>Environment</td>
<td>67.3 (13.8)</td>
<td>61.3 (10.5)</td>
<td>226</td>
<td>0.093</td>
</tr>
</tbody>
</table>
Differences in the quality of life of patients with non-specific inflammatory bowel diseases, depending on their place of residence

Analysis included three groups: rural patients, those living in cities < 300 thousand, and those > 300 thousand inhabitants.

Analysis by means of the non-parametric Kruskal-Wallis test showed differences between groups, considering the environmental (\(\chi^2(2) = 9.563; p = 0.008\)), and social-relations indices (\(\chi^2(2) = 5.2; p = 0.07\)).

Considering the environmental quality of life index, differences were observed between rural (67.7 ±13.5) and large city inhabitants (57 ±13.3) (U= 53; p= 0.039). Differences were also observed between large and small city inhabitants (70 ±9.6) (U=96.5; p= 0.003).

Considering the „relations” index, differences were observed between rural (58.0 ±23.6) and small city inhabitants (74.5 ±13.1) (U=71.5; p= 0.042).

Figure 2 presented mean differences considering quality of life indices, depending on the place of residence.

### Differences in the quality of life of patients with non-specific inflammatory bowel diseases, depending on patient age

R-Pearson’s correlation analysis showed a significant negative relationship between the overall evaluation of the quality of life and age (\(r=-0.379; p=0.006\)).

This means that in the study group, younger patients achieved better results on the overall quality of life scale. With age, the assessment of the quality of life decreases. There are significant differences in the overall quality of life, considering younger and older patients (Me=32). T-Student test analysis showed that both groups significantly differ (t(40.5)=2.05; p=0.045). In case of younger patients the quality of life results are higher (4 ±0.8), as compared to the elderly (3.6 ±0.4).

### Mediator mechanisms – dependency moderators

Authors examined whether the dependency moderator between age and the physical aspect

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**Table 3. Mean quality of life values depending on the actual condition of the patient**

<table>
<thead>
<tr>
<th></th>
<th>Remission</th>
<th>Exacerbation</th>
<th>U Mann-Whitne’y</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical aspect</td>
<td>68.2 (15.45)</td>
<td>44.9 (18.1)</td>
<td>78.5</td>
<td>0</td>
</tr>
<tr>
<td>Psychological aspect</td>
<td>67 (15.2)</td>
<td>54.8 (20.4)</td>
<td>164</td>
<td>0.053</td>
</tr>
<tr>
<td>Relations</td>
<td>68.3 (20.3)</td>
<td>62.9 (16.1)</td>
<td>223.5</td>
<td>0.523</td>
</tr>
<tr>
<td>Environment</td>
<td>68.6 (12)</td>
<td>54.8 (10.2)</td>
<td>100</td>
<td>0.001</td>
</tr>
</tbody>
</table>

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**Fig. 1.** Mean value differences (**p<0.001, **p<0.01, *p<0.05) depending on education

**Fig. 2.** Mean differences (**p<0.001, **p<0.01, *p<0.05) depending on the place of residence
of the quality of life might be attributed to the diagnosis of the disease. The Macrem Process analyses were performed (model 1).

A significant model was obtained \( F(3.48)=4.8; \ p= 0.005 \).

It turned out that a significant relationship between age and physical quality of life was only observed in patients diagnosed with ulcerative colitis \( p<0.001 \) (fig. 3).

Analysis showed that only in patients with ulcerative colitis there was an effect of age on the quality of life, considering the physical aspect. No such dependency was observed in case of patients with Crohn’s disease.

Further analysis showed that the current condition of the patient may also be a significant moderator \( p<0.05 \) of the influence of a given disease on the quality of life, considering the physical aspect. A well-adjusted model was used during data analysis – \( F(3.48)=9.8; \ p<0.001 \). The presented dependency between the type of disease and physical aspect was only observed in the „relapse“ group \( p<0.05 \) (fig. 4).

Analysis showed that only in patients with disease relapse was there influence on the evaluation of the quality of life, considering the physical aspect. No such dependency was observed in the „remission“ group.

**DISCUSSION**

Crohn’s disease and ulcerative colitis remarkably deteriorate the patients’ quality of life and represent a serious problem for the immediate environment. The chronic nature of the disease can limit many everyday activities and fulfillment of social roles. The above-mentioned hinder ones needs, influencing the emotional state, contributing to physical and psychosocial disability (8). Non-specific inflammatory bowel diseases significantly decrease the quality of life. According to the World Health Organisation, the term „quality of life“ is considered as an individual perception of the human life. The quality of life reflects somatic, psychic, social and cultural functions. Each loss within the designated areas entails a lower self-esteem of a given individual, and thus, lower quality of life (8).

The study analysed a series of processes and phenomena, which were classified in four basic aspects: physical aspect, psychological aspect, social relations aspect, and environmental aspect (9). The described disease entities influenced patient answers leading towards decreased quality of life, depending on the mentioned aspects. Analysing the quality of life the above-mentioned areas were treated separately, due to their incomparable character. The designated average quality of life level, depending on the mentioned areas was juxtaposed with nine medical and sociodemographic factors, in order to evaluate their influence and estimate the obtained results. These factors include nutrition, education, gender, age, type of disease, stage of the disease, place of residence, marital status, location of medical care. The above-mentioned conception enables to determine which factor and to what extent, affects or not the presented areas of life.

Parenteral nutrition is associated with mobility difficulties, everyday activities, and possible complications (10). It does not completely limit everyday activities, however, disqualifies from difficult physical work if malnutrition or inflammatory bowel diseases do not take this opportunity. Patients with central or peripheral venous catheters are required to continuously maintain hygiene and supervise punctures in fear of the possibilities of many significant complications (10). In the long term observation intravenous nutrition, as compared to natural nutrition is associated with physical and psychological discomfort, which might influence questionnaire results, and thus, the quality of life.
Statistical surveys have confirmed that parenteral nutrition significantly decreases the overall quality of life in patients with non-specific inflammatory bowel diseases, as compared to natural nutrition. Studies performed by Andrzejewska J. et al. on a population of 92 patients with inflammatory bowel diseases showed a relationship between the quality of life and education. The higher the education the higher the quality of life (11). Our own results confirmed the influence of education on the average level of quality of life, considering the psychological and social relations aspects. Thus, the higher the education, the average quality of life level is higher, considering the psychological and social relations aspects. Heinrich G. and Herschbach P. also mentioned that patients with inflammatory bowel diseases experience a lot less satisfaction in many areas of life during relapse (12). According to Larsson K. et al., patients with disease exacerbations more often complained of pain, being exposed to chronic stress, depression (depressed mood), and frequent disagreements at home and work, as compared to patients in remission (13).

Our results confirmed statistical data analysis of the significant effect of inflammatory bowel disease relapse, as compared to remission on the quality of life, considering the physical, psychological, and environmental aspects. Statistical tests showed that social relations had no influence on the quality of life. Analyses were consistent with the above-mentioned reports confirming the association of the stage of the disease (IBD) with the quality of life, considering physical, psychological, and environmental aspects. Relapse during the course of non-specific inflammatory bowel diseases significantly decreases the average quality of life level. Results obtained by Andrzejewska J. et al. provide information that the lowest quality of life was observed in case of rural patients (11). Statistical analysis confirmed the significant relationship between place of residence and quality of life, considering psychological, social relations, and environmental aspects. However, in case of the physical aspect no such association was observed. Environmental problems probably relating to housing conditions and safety of the inhabited area were evidence that the lowest quality of life was observed in large cities, followed by rural areas, while the highest quality of life in people living in small cities.

CONCLUSIONS

The quality of life in case of patients diagnosed with inflammatory bowel diseases is influenced by the following:

1. Nutrition – parenteral nutrition, as compared to natural nutrition decreases the quality of life, especially considering physical, psychological and social relations aspects.
2. Education – the higher the education the higher the quality of life, especially in psychological and social relations aspects.
3. Stage of the disease – disease exacerbation and intensification of symptoms, contrary to remission reduces the quality of life, considering physical, psychological, and environmental aspects.
4. Place of residence – rural inhabitants, as compared to small city residents have the lowest quality of life, considering social relations. People from large cities as compared to all others have the lowest quality of life, considering the environmental aspect.

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