POSTGRADUATE EDUCATION

THE EFFECT OF SELECTED DEMOGRAPHIC, PSYCHOSOCIAL AND HEALTHY ASPECTS ON QUALITY OF LIFE OF PATIENTS WITH MULTIPLE MYELOMA AND ACUTE MYELOID LEUKAEMIA UNDERGOING AUTOLOGOUS HAEMATOPOIETIC STEM CELL TRANSPLANTATION: A RETROSPECTIVE ANALYSIS
(Dissertation thesis)

Ladislav SLOVÁČEK

[1]University of Defence, Faculty of Military Health Sciences, Department of Field Internal Medicine, Hradec Kralove, Czech Republic
[2]University Hospital and Faculty of Medicine of Charles University in Prague, Department of Clinical Oncology and Radiotherapy, Hradec Kralove, Czech Republic

Summary

*Aim: The study analyses the quality of life (QoL) in patients with multiple myeloma (MM) and acute myeloid leukaemia (AML) undergoing autologous haematopoietic stem cell transplantation (HSCT). **Patients and Methods:** The total number of respondents with AML was 12 (7 male, 5 female). The total number of respondents with MM was 32 (18 male, 14 female). The average age of patients with AML was 47.5 years and average age of patients with MM was 60 years. The Czech version of an international generic European Quality of Life Questionnaire – Version EQ-5D was used. The effect of selected psychosocial, health and demographic aspects on QoL in patients was determined by means of variance analysis. The descriptive analysis was used for evaluation of QoL questionnaires. **Results:** The above-mentioned aspects proved a statistically significant dependence of QoL (EQ-5D score and EQ-5D VAS) on age in both cohorts (p<0,01), religion in AML cohort (p<0,05), smoking abuse in both cohorts (p<0,01), level of education in AML cohort (p<0,05), increasing number of associated diseases in both cohorts (p<0,05) and type of disease (p<0,05). **Conclusion:** The global QoL in patients with AML is at a higher level than in patients with MM treated by means of autologous PSCT.*

Key words: Quality of life; Haematopoietic stem cell transplantation; Acute myeloid leukaemia; Multiple myeloma.

Introduction

The haematopoietic stem cell transplantation (HSCT) is a specific therapeutic method used for bio-modulation antitumour therapy of haematological malignities and of the solid tumours. It is also used for the therapy of non-tumour and hereditary diseases (1, 2, 24). It is divided into the bone marrow transplantation (BMT), the transplantation of stem (progenitor) cells (PSCT) and the umbilical cord blood transplantation (UCBT). From a donor's point of view there are three kinds of HSCT: syngenic transplantation (the donor is a monozygotic twin), allogeneic HSCT (HLA from a compatible sibling or parent or HLA from a compatible donor) and autologous HSCT (patient itself is the donor). The aim of HSCT is to replace a patient's pathological bone marrow which contains tumorous cells with hematopoietic cells from a health donor and to restore hematopoiesis which is damaged by an intensive antitumour therapy (1, 2). HSCT influences the further course of disease, and by this the quality of life (QoL) for patients in the same way as other therapeutic methods (6, 7, 9, 11, 16, 19, 22, 23, 24, 25, 27, 29, 30, 35).

The QoL is defined as "a patient's subjective evaluation of his life situation" (24, 30, 32). The QoL term contains the information on an individual's physical, psychological, social and spiritual condition (17, 18, 24, 32). The QoL evaluation is carried out by means of generic and specific questionnaires. Generic QoL questionnaires generally evaluate a patient's overall condition regardless his disease. Specific QoL questionnaires are designed for the evaluation of a patient's overall condition in a particular type of disease. Modules are often used with these specific questionnaires. These modules are focused on specific symptoms and complaints in a particular type of disease (17, 18, 24, 32).

Objective

To evaluate the effect of selected psychosocial, health and demographic aspects on QoL in patients with multiple myeloma (MM) and acute myeloid leukaemia (AML) undergoing autologous HSCT.

Aims of study

The study has a few aims: To analyse the effect of selected psychosocial, health and demografic aspects on QoL in patients with MM and AML undergoing autologous HSCT.

To evaluate the global QoL in patients with MM and AML undergoing autologous HSCT.

Design of study

The study is a cross-sectional and retrospective. It is based on data obtained during the year 2004//2005 (from September 1, 2004 to January 31, 2005) in 12 adult patients with AML and 32 adult patients with MM undergoing autologous HSCT from 2001 to 2003 at the Department of Clinical Haematology of the 2nd Internal Clinic of Charles University Hospital and Faculty of Medicine in Hradec Králové, Czech Republic. The study was approved the Ethics Committee of the Charles University Hospital.

Patients and Method

Group characteristics

The total number of respondents with AML undergoing autologous HSCT was 12 (7 male, 5 female). The average age of respondents with AML was 47,5 years old (range 27–68 years old). The total number of respondents with MM undergoing autologous HSCT was 32 (18 male and 14 female). The average age of respondents with MM was 60 years old (range 45–78 years old).

Instrument

The Czech version of an international generic EuroQol EQ-5D Questionnaire was used in the study (5, 10, 15, 34). This questionnaire evaluates 2 indicators, objective and subjective indicators. The objective indicator includes 5 dimensions of QoL: mobility, self-care, usual activities, pain/dis-comfort, anxiety/depression. Three kinds of answers which express the degree of complaints are offered to each question (no complaints, mild complaints, severe complaints). Totally 243 (35) combinations of health condition exits. The outcome is EQ-5D score (dimensions of QoL) which has the values from 0 to 1 (0 – the worst health condition, 1 – the best health condition). Subjective indicator includes visual analogous scale (the value of 100 – the best health condition, the value of 0 – the worst health condi-

tion). The respondent marks his subjectively perceived health condition at the thermometer scale. The outcome is EQ-5D VAS (a subjective health condition) which has the values from 0 to 100.

Data analysis, statistical analysis

The evaluation of questionnaires was carried out by means of descriptive analysis in accordance with European Quality of Life Group Method (15, 34). The independent variables were age, sex, level of education, marital status, increasing number of associated diseases, smoking abuse, religion, type of disease and time lapse from autologous PSCT. The dependent variables were EQ-5D score (dimensions of QoL) and EQ-5D VAS (a subjective health condition). The effect of selected aspects of QoL of patients was evaluated by means of analysis of variance (ANOVA). The StatSoft STATISTICA Base 7,1 software was used for complete evaluating of dates. The value $p < 0,05$ was considered significant.

Procedure

The QoL questionnaire with a covering letter, in which the whole project was explained, together with a stamped envelope were mailed to a respondents address. The filling in the questionnaire was voluntary and anonymous.

Results of study

The above-mentioned aspects proved statistically significant dependence of QoL (EQ-5D score and EQ-5D VAS) on age in both cohorts ($p < 0,01$) (see Table I and Figure I), religion in AML cohort ($p < 0,05$) (see Table II), smoking abuse in both cohorts ($p < 0,01$) (see Table III and Figure II), level of education in AML cohort ($p < 0,05$) (see Table IV), increasing number of associated diseases in AML cohort ($p < 0,05$) (see table V) and type of disease ($p < 0,05$) (see Table VI). The effect of other aspects on QoL was not proven as statistically significant.

The global QoL in patients with AML undergoing autologous HSCT is on greatly good level (mean value of EQ-5D score was 75,1%, mean value of EQ-5D VAS was 67,5%) than in patients with MM undergoing autologous HSCT (mean value of EQ-5D score was 68,9%, mean value of EQ-5D VAS was 66,6%).

Table I

Comparison of mean values of EQ-5D score and mean values of EQ-5D VAS in individual age groups in respondents with AML (n = 12, p<0,01)

Age range	Number of respondents	Mean values of EQ-5D score (in %)	Standard deviation	Mean values of EQ-5D VAS (in %)	Standard deviation
20–29	1	**70**	0	**60**	0
30–39	1	**98**	0	**95**	0
40–49	5	**86,2**	15,7	**73,6**	13,9
50–59	3	**60**	14,5	**58,3**	2,4
60–69	2	**61**	15	**56**	4

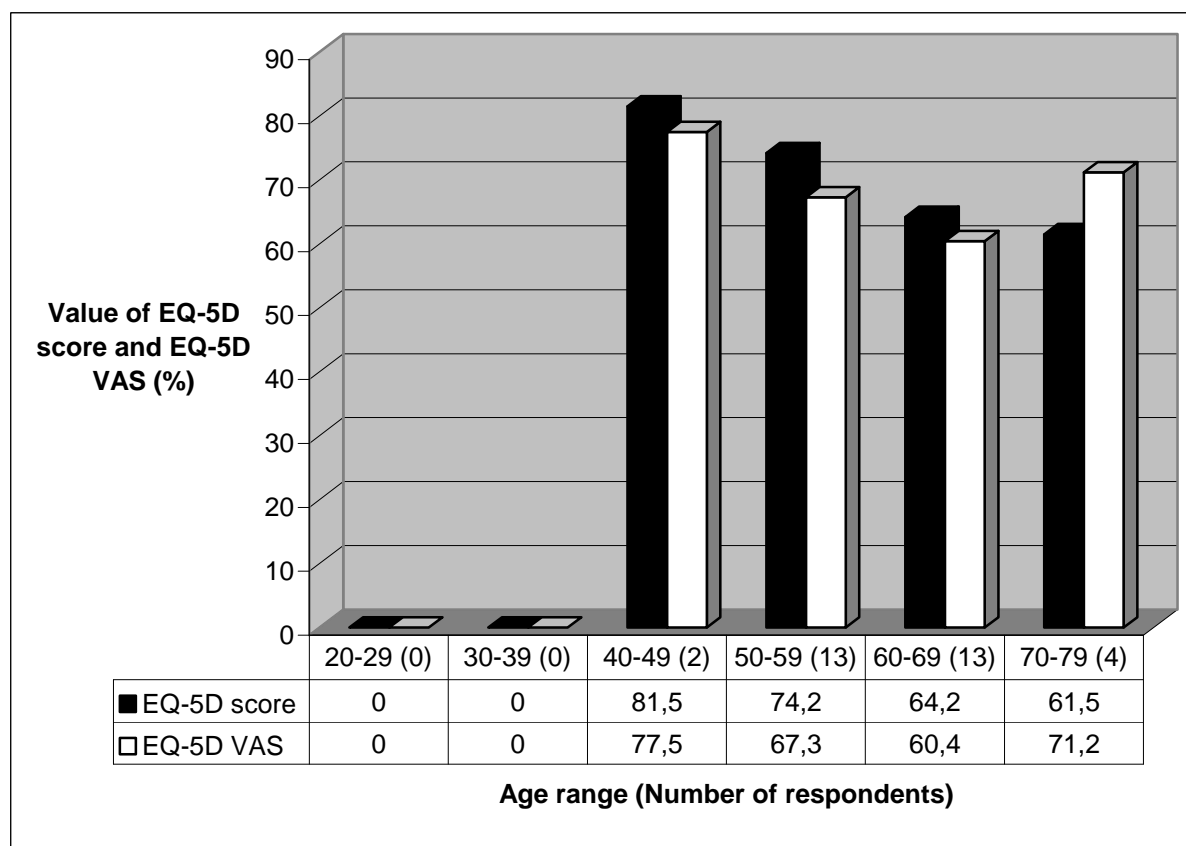|	20-29 (0)	30-39 (0)	40-49 (2)	50-59 (13)	60-69 (13)	70-79 (4)
■ EQ-5D score	0	0	81,5	74,2	64,2	61,5
□ EQ-5D VAS	0	0	77,5	67,3	60,4	71,2

Age range (Number of respondents)

Figure I: Dependence of EQ-5D score and EQ-5D VAS on individual age groups in respondents with MM (n = 32, p<0,01)

Table II

Comparison of mean values of EQ-5D score and mean values of EQ-5D VAS with religion in respondents with AML (n = 12, p<0,05)

Religion	Number of respondents	Mean values of EQ-5D score (in %)	Standard deviation	Mean values of EQ-5D VAS (in %)	Standard deviation
Believers	8	**83,9**	15,9	**71**	16,6
Non-believers	4	**57,5**	17,6	**60,5**	10,2

Table III

Comparison of mean values of EQ-5D score and mean values of EQ-5D VAS with smoking abusu in respondents with AML (n = 12, p<0,01).

Smoking abusu	Number of respondents	Mean values of EQ-5D score (in %)	Standard deviation	Mean values of EQ-5D VAS (in %)	Standard deviation
Non-smokers	6	**90,7**	11,4	**77,2**	16,4
Smokers	6	**59,5**	14,1	**57,8**	3,5

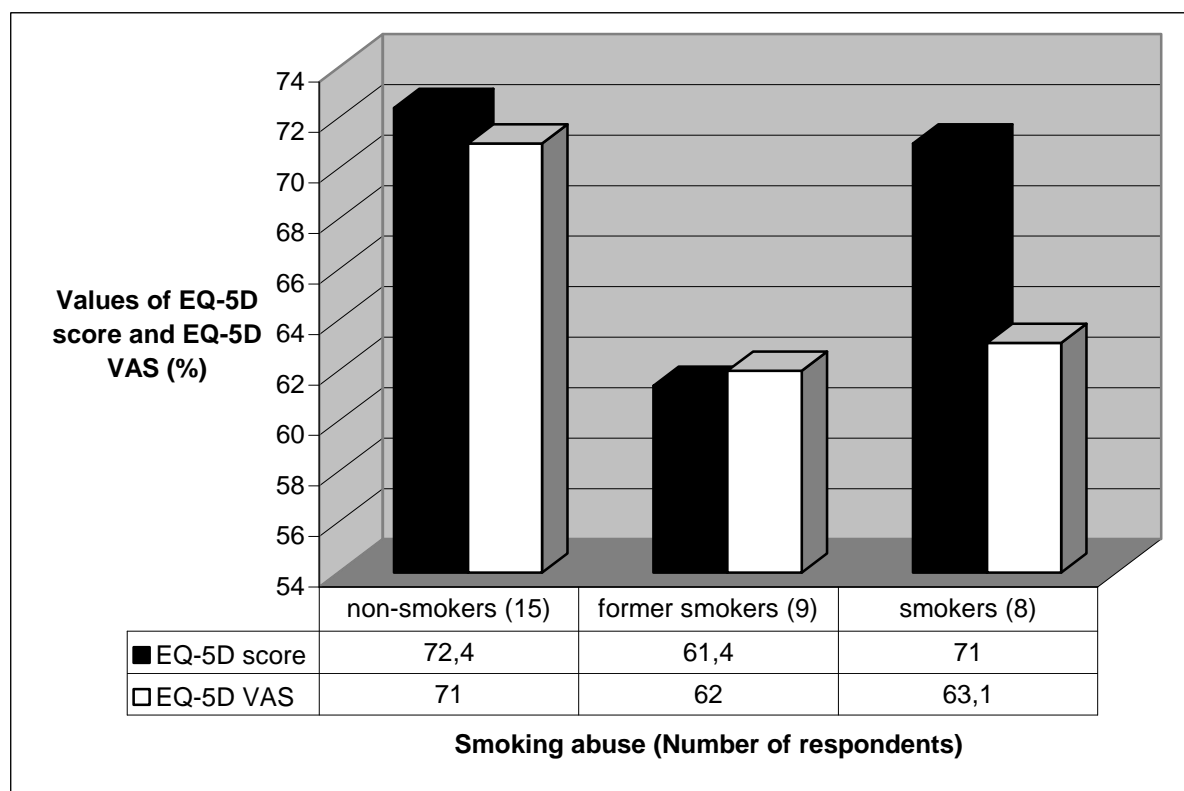| Values of EQ-5D score and EQ-5D VAS (%)	non-smokers (15)	former smokers (9)	smokers (8)
■EQ-5D score	72,4	61,4	71
□EQ-5D VAS	71	62	63,1

Smoking abuse (Number of respondents)

Figure II: Dependence of EQ-5D score and EQ-5D VAS on smoking abuse in respondents with MM (n = 32, p<0,01)

Table IV

Comparison of mean values of EQ-5D score and mean values of EQ-5D VAS with level of education in respondents with AML (n = 12, p<0,05)

Level of education	Number of respondents	Mean values of EQ-5D score (in %)	Standard deviation	Mean values of EQ-5D VAS (in %)	Standard deviation
Elementary	2	**43**	4,2	**53,5**	2,12
Apprentice	3	**67**	8,5	**60**	0
Secondary	3	**74**	4,0	**65**	8,7
University	4	**98**	0	**82**	17,9

Table V

**Comparison of mean values of EQ-5D score and mean values of EQ-5D VAS with increasing number
of associated diseases in respondents with AML
(n = 12, p<0,05)**

Number of disease	Number of respondents	Mean values of EQ-5D score (in %)	Standard deviation	Mean values of EQ-5D VAS (in %)	Standard deviation
0	3	**88,7**	16,2	**71,7**	20,2
1	4	**83,2**	18,7	**77**	15,7
2	4	**64**	16,6	**58,8**	2,5
3 and more	1	**46**	0	**52**	0

Table VI

**Comparison of respondents with AML and MM according to the level of troubles and the type of disease
(n = 44, p<0,05)**

Dimension of QoL	Level of evaluation	AML		MM	
Number of respondents		*abs.*	*rel.*	*abs.*	*rel.*
Mobility	*none troubles*	**10**	**83,3** %	**13**	**41** %
	with troubles	**2**	**16,7** %	**19**	**59** %
	immobile	**0**		**0**	
Self-care	*none troubles*	**10**	**83,3** %	**26**	**81,2** %
	with troubles	**2**	**16,7** %	**6**	**18,8** %
	incapable	**0**		**0**	
Usual activities	*none troubles*	**9**	**75** %	**6**	**18,8** %
	with troubles	**3**	**25** %	**26**	**81,2** %
	incapable	**0**		**0**	
Pain/discomfort	*none*	**10**	**83,3** %	**9**	**28,1** %
	weighty	**2**	**16,7** %	**22**	**68,8** %
	extremely	**0**		**1**	**3,1** %
Anxiety/depression	*none*	**9**	**75** %	**13**	**41** %
	Weighty	**2**	**16,6** %	**19**	**59** %
	Extremely	**1**	**8,4** %	**0**	
Number of respondents		*12*		*32*	

Discussion for results

Five main outcomes follow from our study:

1. The effect of age on QoL in patients with MM and AML undergoing autologous HSCT has been proved.

Our results show that a lower QoL correlates with increasing age of patients treated by means of autologous HSCT. De Souza (14), Heinonen (20, 21), Chiodi (13), Wang (36), Wong (37), Andrykowski (3) and Zittoun (38) discovered a similar trend in their studies. De Souza (14) points out in his longitudinal study conducted in the group of 26 patients (13 patients who underwent BMT and 13 patients who underwent PSCT) a lower QoL in both groups of these patients. He (14) found no differences according to the type of HSCT. Patients were tested by means of a generic WHO QOL-100 Questionnaire and Hospital Anxiety and Depression Scale (HADS). De Souza (14) further explained his statements by the fact that with increasing age a number of as-

sociated diseases can occur. These diseases reduce the QoL. Choidi (13) also agrees with this opinion in his transversal study conducted in the group of 244 patients with hematological malignities who underwent the allogeneic BMT. He (13) divided these patients into 3 groups (the first group was 1 year after the allogeneic transplantation, the second group was 3 years after the allogeneic transplantation and the third group was 5 years after the allogeneic BMT). Methodologically patients were tested by means of Psychosocial Adjustment to Illness Scale (PAIS). Choidi (13) also points out the fact that in addition to polymorbidity a negative influence of cGVHD on a lower QoL in patients with increasing age should be stressed. Wang (36), Wong (37) and Andrykowski (3) also agree with the influence of cGVHD on a lower QoL in patients with increasing age. Zittoun (38) discovered another interesting piece of information in his transversal study conducted in the group of 179 patients with hematological malignities who underwent HSCT. He (38) points out that increasing overall fatigue and emotional complaints which decrease the QoL correlate with increasing age. Patients were tested by means of a specific European Organization Research and Treatment of Cancer – C30 Questionnaire (EORTC QLQ-C30), HADS and a specific Leukemia/Bone Marrow Transplantation Module (Leukemia/BMT module) (38). So (33) also discovered an interesting piece of information in his transversal study conducted in the group of 157 patients with hematological malignities who underwent BMT. He (33) proved a high degree of overall fatigue in patients over the age of 50 with associated diseases. Patients were tested by means of Fatigue Scale – Chinese Version. Another author who agrees with Zittoun's (38) and So's (33) opinions is Saleh (31). He conducted a transversal study in the group of 41 patients who underwent BMT. This author (31) points out that in patients with an increasing number of associated diseases there is a lower overall physical condition and this means the lower QoL. Patients were tested by means of a specific Quality of Life – Bone Marrow Transplant Survivors Tool (QOL--BMT-ST) 30 months after BMT (31).

2. The effect of religion on QoL in patients with AML undergoing autologous HSCT has been proved.

It is clear from our results that the QoL in patients who underwent HSCT and believed in God was higher than in patients who were non-believers. According to Pospíšilová (28) the real QoL is associated with spiritual growth of a human being. This means real inner wealth which nobody can give the other person or take it from this person. Creative values and values concerning experience and attitudes are also important. These values are according to Pospíšilová (28) virtues in Christian tradition. Bach (4) recorded these changes in values in patients who underwent BMT. The above-mentioned changes often mean that the patient has to stop various activities, including his interests and hobbies. Boyd (8) proved significant changes in patients who underwent HSCT and believed in God. Patients who believed in God had a higher QoL than non-believers.

3. The effect of smoking abusu on QoL in patients with MM and AML undergoing autologous HSCT has been proved.

In both cohorst of patients we proved lower global QoL in smokers in comparison with non-smokers or former smokers. Chang (12) found an opposite trend in his longitudial follow-up of patients with chronic myeloid leukaemia following allogeneic HSCT, in whose an effect of alcohol and smoking abuse on QoL was observed. The group consisted of 114 patients. The author did not prove in his study the effect of alcohol and smoking abuse on QoL in this group of patients (12).

4. The effect of level education on QoL in patients with AML undergoing autologous HSCT has been proved.

Henoinen (20, 21) points out in his longitudinal study conducted in the group of 109 patients who underwent the allogeneic BMT a higher QoL in patients with higher education, this means patients with secondary and university education. Patients were tested by means of a specific FACT-BMT – Version 3 Questionnaire. This questionnaire was presented to patients the 1st and the 5th year after this allogeneic BMT. Andrykowski (3) arrived at a similar conclusion in his multicentric longitudinal study conducted in the group of 200 patients with hematooncological diseases who underwent BMT (46% of patients the allogeneic BMT and 54% of patients the autologous BMT). He (3) proved a lower QoL in patients with lower education, this means patients with elementary and apprentice education. Patients were tested by means of a specific BMT – QoL Questionnaire. They were presented

this questionnaire before this transplantation and the 1st year after this BMT.

5. The effect of increasing number of associated diseases on QoL in patients with AML undergoing autologous HSCT has been proved.

Our results had shown that a lower QoL correlates with an increasing number of associated diseases (polymorbidity). Our results correlate with the results of significant studies conducted by De Souza (14) and Chiodi (13). Zittoun (38) discovered an interesting piece of information which showed the correlation among polymorbidity, overall fatigue and emotional difficulties. Another scientist who agreed with this opinion was So (33) in his transversal study conducted in the group of 157 patients with hematological malignities who underwent BMT. He (33) proved a high degree of overall fatigue in patients over the age of 50 with associated diseases (33). Patients were tested by means of Fatigue Scale – Chinese Version. Saleh (31) also agrees in his transversal study conducted in the group of 41 patients who underwent BMT with Zittoun's (38) and So's (33) opinions. This author stresses the fact that in patients with an increasing number of associated diseases there is a lower overall physical fitness and this causes a lower QoL. Patients were tested by means of a specific Quality of Life – Bone Marrow Transplant Survivors Tool (QOL-BMT-ST) 30 months after BMT. Heinonen (20, 21) recorded in his longitudinal study conducted in the group of 109 patients who underwent the allogeneic BMT a lower QoL in patients in connection with polymorbidity, increased morbidity, increasing overall fatigue and worse quality of sleep. When he compared polymorbid men and women who underwent the allogeneic BMT he discovered a lower quality of life in women (20, 21).

Conclusion

It is common in the clinical practice to evaluate a patient´s health condition and the success of the treatment based only on one type of markers, the most often by means of somatic, laboratory or detecting markers. But the trend in modern medicine is to evaluate a patient's health condition in a more complex way, using other aspects. The QoL means more dimensional evaluation of a number of life aspects. Different aspects can be affected in a different way in a different phase of the disease and

its treatment. That is why this information enriches our knowledge concerning patient's needs and it can significantly contribute to the medical treatment improvement. It can also help us to reveal the mechanisms which modify the origin and the course of disease (26, 30).

We are aware of the fact that our study can be limited by a few factors: 1. The cross-sectional type of the study informs us only about the QoL in patients with AML and MM at a certain time undergoing autologous HSCT and it does not show developmental trend. 2. The study deals only with the influence of selected aspects on QoL. We could add a few other aspects. But we decided for these factors because patients were able and willing to provide this information in retrospectively and anonymously carried out study. 3. The small group of patients with AML undergoing autologous HSCT.

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Correspondence: Ladislav Slováček, MD., Ph.D., major
　　　　　　　　University of Defence
　　　　　　　　Faculty of Military Health Sciences
　　　　　　　　Třebešská 1575
　　　　　　　　500 01 Hradec Králové
　　　　　　　　Czech Republic
　　　　　　　　e-mail: ladislav.slovacek@seznam.cz