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Quality of Life Findings of Adjuvant FOLFOX4 vs. XELOX in Stage III Colon Cancer Patients

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Background: To compare the quality of life (QoL), the convenience of chemotherapy and satisfaction between colon cancer patients treated with FOLFOX4 and XELOX.
Methods: The study was conducted in 26 patients with stage III colon cancer. Patients were received FOLFOX4 (n=17) or XELOX (n=9). QoL, convenience, and satisfaction were assessed using the Quality of Life Questionnaire-C30 (QLQ-C30), Quality of Life Questionnaire-Chemotherapy Induced Peripheral neuropathy (QLQ-CIPN) and Functional Assessment of Chronic Illness Therapy Chemotherapy Convenience and Satisfaction Questionnaire (FACIT-CCSQ), respectively. Patients completed questionnaires at baseline, at cycle 4 (C4) and cycle 8 (C8) (FOLFOX4) or at cycle 3 (C3) and cycle 6 (C6) visits (XELOX) and at their final visit.
Results: In the QLQ-C30, at the final visit, XELOX patients had better functional scores than FOLFOX4 patients (physical: 85.7 vs.60.4, p=0.03; role: 83.3 vs. 57.5, p=0.04) as well as better symptom scores (constipation: 9.5 vs. 40.4, p=0.01). In CIPN, at the C6/C8 visit, XELOX patients had lower motor scale scores than FOLFOX4 patients (3.8 vs. 21.6, p=0.02). Moreover, at the C6/C8 visit, XELOX was more convenient than FOLFOX4 in FACIT-CCSQ (79.7 vs. 55.5, p=0.04). Male patients were especially likely to consider XELOX to be more convenient (90.0 vs. 55.0, p=0.01) and satisfactory (55.4 vs. 26.2, p=0.03) and fewer concern (91.0 vs. 65.0, p=0.03) than FOLFOX4. XELOX patients spent fewer days on hospital visits at C3/C4, C6/C8 and final visit (2.8 vs. 4.2, p=0.01; 2.7 vs. 4.1, p=0.01; 3.0 vs. 4.5, p=0.01).
Conclusion: XELOX may be a better adjuvant chemotherapy choice for patients with colon cancer than FOLFOX4 in terms of QoL, convenience, and satisfaction.

Key Words: Quality of life, Colon cancer, XELOX, FOLFOX4

INTRODUCTION

Colorectal cancer (CRC) incidence is varied worldwide. CRC is the most common cancer of the gastrointestinal system,[1] and the third most common cancer overall in Korea, with an incidence of almost 2800 patients in 2013.[2]

The standard primary treatment for patients with colon cancer is surgical resection.[3,4] Adjuvant chemotherapy is reasonable for patients with high-risk stage II colon cancer (high-risk means at least one of the following: stage T4, perforation or obstruction at presentation, <12 lymph nodes determined by pathology and angioinvasion) and stage III colon cancer,[3,5] 5-Fluorouracil/leucovorin plus oxaliplatin (FOLFOX4) or oral capecitabine plus oxaliplatin (XELOX) are commonly used for adjuvant chemotherapy in colon cancer patients.[5-7] The survival rate for patients has increased in recent years due to an emphasis on early appropriate treatment8. However, many patients suffer from psychiatric and physical stress during treatment of adjuvant chemotherapy due to side effects. Thus, patient's quality of life (QoL), convenience and satisfaction are increasingly important for clinical outcomes.[9,10]

The Cancer Quality of Life Questionnaire-C30 (QLQ-C30) was developed and validated by the European Organization for Research and Treatment of Cancer (EORTC).[10] The Quality of Life Questionnaire-Chemotherapy-Induced Peripheral Neuropathy (QLQ-CIPN) has also been used by many studies.[11] The Chemotherapy Convenience and Satisfaction Questionnaire (CCSQ) module was developed for the Functional Assessment of Chronic Illness Therapy (FACIT) Measurement System.[10]

The aim of this study was to compare the difference of QoL,

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the convenience of chemotherapy, and health-care satisfaction between colon cancer patients treated with FOLFOX4 and XELOX after surgery. We hypothesized that differences in these variables would be minimal between two treatment groups.

SUBJECTS AND METHODS

1. Subjects

This study was conducted to assess QoL in patients treated for colon cancer at Kosin University Gospel Hospital over a 2-year period, from January 2014 to December 2015. The study included 26 patients with stage III colon cancer. After we explained the FOLFOX4 and XELOX protocols to patients, the patient selected their own chemotherapy regimens. Patients received either FOLFOX4 (n=17) or XELOX (n=9).

The FOLFOX4 regimen consisted of LV, 200 mg/m^2/day given as a 2-hour infusion, followed by a bolus 5-FU, 400 mg/m^2, and a 22-hour continuous infusion of 5-FU, 600 mg/m^2, repeated for 2 consecutive days. Oxaliplatin, 85 mg/m^2, was administered on day 1 only and was given as a 2-hour infusion, concurrent with LV. The cycles were repeated every 2 weeks. The XELOX regimen consisted of oxaliplatin, 130 mg/m^2/day given as a 2-hour infusion and capecitabine 1,000 mg/m^2 given as oral, twice a day on day 1 to 14. The cycles were repeated every 3 weeks.

2. QoL Measures

Assessments of QoL, convenience, and satisfaction were based on EORTC QLQ-C30, QLQ-CIPN and the CCSQ module from the FACIT scale.[12,13] In our study, EORTC QLQ-C30 Korean version, QLQ-CIPN Korean version 3 and FACIT-CCSQ Korean version 3.1 were used.

The EORTC QLQ-C30 is a 30 item self-reported questionnaire. It assesses five functional scales including physical, role, emotional, cognitive and social function. It also evaluates global health status/ QoL with nine symptom scales including fatigue, nausea or vomiting, pain, dyspnea, insomnia, appetite loss, constipation, diarrhea and financial impact. Functional scales and symptom scales are scored from 1 (not at all) to 4 (very much) and the question assessing global health status/ QoL was scored from 1 (very poor) to 7 (excellent). Each score was linearly converted to a scale from 0 to 100. Higher scores for functional scales and global health status indicated better health status, whereas higher scores on symptom scales indicated worse symptoms.

The QLQ-CIPN is a 20-item questionnaire that has three subscales including sensory, motor and autonomic scales. All scales are scored from 1 (not at all) to 4 (very much). All scores were converted to a scale from 1 to 100. Higher scores represent worse symptoms/ problems. In other words, a high score means worse status.

The FACIT-CCSQ has three subscales including convenience, concerns, and satisfaction. All scores were converted to a scale of 0-100 according to standard scoring procedures. Higher scores on subscales indicated better results for chemotherapy concerns (i.e., fewer concerns about or less bother from side effects), better chemotherapy convenience, and better chemotherapy satisfaction.

QoL assessments were carried out at the same time as

Table 1. Baseline patient demographic characteristics

		FOLFOX4 group, n=17	XELOX group, n=9	p-value
Age	Mean±SD	62.6±13.3	56.0±6.8	0.18
Gender				
Male	n (%)	6 (35.3)	6 (66.7)	0.22
Female	n (%)	11 (64.7)	3 (33.3)	
BMI	Mean±SD	1.6±0.2	1.6±0.2	0.85
ECOG PS				0.45
0-1	n (%)	16 (94)	9 (100)	
2	n (%)	1 (6)	0 (0)	
Tumor site				0.59
Ascending colon	n (%)	3 (17.6)	1 (11.1)	
Transverse colon	n (%)	5 (29.4)	1 (11.1)	
Descending colon	n (%)	3 (17.6)	1 (11.1)	
Sigmoid colon	n (%)	6 (35.4)	6 (66.7)	

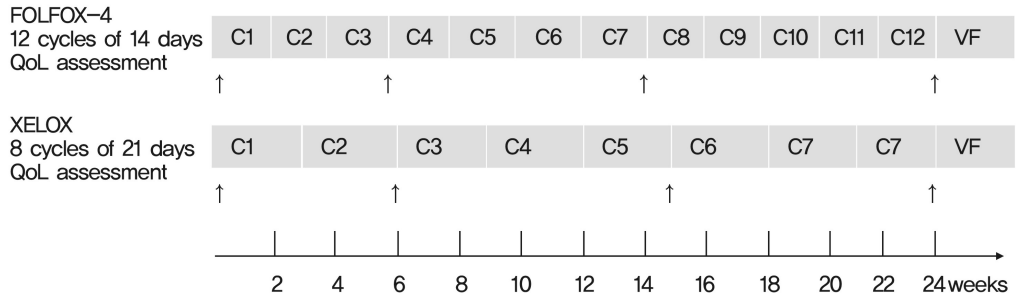

Fig. 1. Questionnaire assessment schedule. C: cycle, VF: final visit

tumor imaging assessments, that is at baseline, at cycle 4 (C4) and cycle 8 (C8) visits (FOLFOX4) or cycle 3 (C3) and cycle (C6) visits (XELOX) and at the final visit (VF) (Fig. 1).

3. Statistical methods

Data from questionnaires are presented as median (range: min-max). Because our sample size was small, data analyses were performed by SPSS using the Mann-Whitney test. P-values<0.05 were considered to be statistically significant.

RESULTS

1. Study sample

A total of 26 patients (FOLFOX4 n=17, XELOX n=9) with stage III colon cancer were enrolled in the study. In the FOLFOX4 group, one patient was dropped after regimen change due to oxaliplatin-induced anaphylaxis, one patient was dropped due to general weakness and one patient was dropped due to refusal. In the XELOX group, one patient was dropped due to general weakness and two patients were dropped due to refusal. At the study end point, the survival rate for all patients was 100 percent and there were no recurrences in either group. Baseline characteristics of these patients are shown in Table 1. Each total dose of oxaliplatin used in all schedule of chemotherapy was 1,632±204 mg in the FOLFOX4 group and 1,664±208 mg in the XELOX group. There was no significant difference.

2. QoL results

1) EORTC QLQ-C30 scores

No significant differences were observed between the FOLFOX4 and XELOX groups at baseline, C4/C3 or C8/C6 visits. However, at the final visit, significant differences were observed between both groups. The XELOX group had better functional scores than the FOLFOX4 group (physical: 85.7 vs. 60.4, p=0.03; role: 83.3 vs. 57.1, p=0.04) as well as better symptom scores (constipation: 9.5 vs. 40.4, p=0.01) (Table 2). Moreover, in patients aged <70 years, XELOX symptom scores were better than FOLFOX4 symptom scores (constipation: 9.5 vs. 37.5, p=0.01) (Table 3). There were no significant differences in scores between male patients treated with XELOX and FOLFOX4 (Table 4). However, in female patients, XELOX group had better functional scores than FOLFOX4 group (physical: 90.0 vs. 54.0, p=0.01) (Table 5).

2) QLQ-CIPN20 scores

At the C6/C8 visit, patients treated with XELOX had lower motor scale scores than those treated with FOLFOX4 (3.8 vs. 21.6, p=0.03). Results of the QLQ-CIPN20 are summarized in Table 6.

3) FACIT-CCSQ scores

At the C6/C8 visit, patients treated with XELOX considered their treatment to be more convenient than patients treated with FOLFOX4 (79.7 vs. 55.5, p=0.04) (Fig. 2). Male patients were especially likely to consider XELOX to be more convenient (90.0 vs. 55.0, p=0.01) and satisfactory (55.4 vs. 26.2, p=0.03) and fewer concern (91.0 vs. 65.0, p=0.03) than FOLFOX4 (Fig. 3). Moreover, XELOX patients spent fewer days on hospital visits at the C4/C3, C8/C6 and final visit (4.2 vs. 2.8, p=0.01; 4.1 vs. 2.7, p=0.01; 4.5 vs. 3.0, p=0.01) (Table 7).

DISCUSSION

This study is the first clinical trial in Korea to use the EORTC QLQ-C30, EORTC CIPN20, and FACIT-CCSQ to assess QoL, convenience and satisfaction with adjuvant chemotherapy among patients with stage III colon cancer. The aim of this study was to compare QoL, convenience and

Table 2. EORTC QLQ-C30 assessments in the QLQ-C30 set (n=26)

EORTC QLQ-C30	FOLFOX4 group, n=17		XELOX group, n=9		p-value
	n	Median (min-max)	n	Median (min-max)	
Physical functioning (%)					
Baseline	17	75.3 (50-100)	9	86.6 (70-100)	0.56
C4/C3	17	70.5 (55-100)	8	88.5 (70-100)	0.06
C8/C6	15	72.4 (50-100)	7	86.6 (70-100)	0.07
Final visit	14	60.4 (40-80)	6	85.7 (70-100)	0.03
Role functioning (%)					
Baseline	17	76.5 (50-100)	9	85.1 (70-100)	0.83
C4/C3	17	67.6 (40-90)	8	78.5 (70-100)	0.26
C8/C6	15	67.7 (40-90)	7	81.2 (70-100)	0.21
Final visit	14	57.5 (40-80)	6	83.3 (70-100)	0.04
Cognitive functioning (%)					
Baseline	17	75.5 (60-100)	9	81.4 (65-100)	0.83
C4/C3	17	82.5 (70-100)	8	88.5 (70-100)	0.85
C8/C6	15	77.7 (60-90)	7	85.4 (70-100)	0.68
Final visit	14	78.5 (50-100)	6	90.4 (75-100)	0.06
Emotional functioning (%)					
Baseline	17	83.3 (75-100)	9	86.1 (70-100)	0.99
C4/C3	17	78.5 (60-100)	8	79.7 (65-100)	0.90
C8/C6	15	83.3 (70-100)	7	79.1 (60-100)	0.88
Final visit	14	71.4 (60-100)	6	86.9 (70-100)	0.47
Social functioning (%)					
Baseline	17	78.4 (50-100)	9	70.3 (50-100)	0.43
C4/C3	17	69.6 (40-100)	8	78.5 (50-100)	0.49
C8/C6	15	71.1 (50-100)	7	68.7 (50-100)	0.83
Final visit	14	83.3 (60-100)	6	83.3 (60-100)	0.97
Global quality of life scale (%)					
Baseline	17	63.7 (40-100)	9	61.1 (40-100)	0.87
C4/C3	17	58.3 (40-100)	8	63.1 (40-100)	0.46
C8/C6	15	62.7 (40-100)	7	72.9 (50-100)	0.33
Final visit	14	58.3 (40-100)	6	69.0 (50-100)	0.26
Fatigue (%)					
Baseline	17	32.6 (1-60)	9	28.3 (1-40)	0.92
C4/C3	17	33.9 (1-60)	8	34.9 (1-50)	0.85
C8/C6	15	34.0 (10-50)	7	36.1 (1-50)	0.78
Final visit	14	21.6 (1-40)	6	26.9 (1-50)	0.07
Nausea and vomiting (%)					
Baseline	17	8.8 (1-20)	9	3.7 (1-20)	0.60
C4/C3	17	13.7 (1-20)	8	21.4 (1-30)	0.62
C8/C6	15	22.2 (1-40)	7	18.7 (1-30)	0.59
Final visit	14	21.4 (1-40)	6	11.9 (1-30)	0.40
Pain (%)					
Baseline	17	21.5 (1-40)	9	20.3 (1-40)	0.92
C4/C3	17	17.6 (1-40)	8	19.5 (1-20)	0.99
C8/C6	15	24.4 (1-40)	7	12.5 (1-30)	0.33
Final visit	14	19.0 (1-40)	6	11.9 (1-30)	0.59
Dyspnea (%)					
Baseline	17	15.6 (1-40)	9	7.4 (1-20)	0.43
C4/C3	17	19.6 (1-40)	8	9.5 (1-20)	0.53
C8/C6	15	16.6 (1-40)	7	8.3 (1-20)	0.29
Final visit	14	19.0 (1-40)	6	19.0 (1-30)	0.62

Table 2. EORTC QLQ-C30 assessments in the QLQ-C30 set (n=26) (continued)

EORTC QLQ-C30	FOLFOX4 group, n=17		XELOX group, n=9		p-value
	n	Median (min-max)	n	Median (min-max)	
Insomnia (%)					
Baseline	17	23.5 (1-50)	9	18.5 (1-40)	0.60
C4/C3	17	29.4 (1-50)	8	19.0 (1-40)	0.76
C8/C6	15	28.8 (1-50)	7	29.1 (1-50)	0.78
Final visit	14	14.2 (1-50)	6	14.2 (1-50)	0.73
Appetite loss (%)					
Baseline	17	23.7 (1-40)	9	25.9 (1-50)	0.46
C4/C3	17	25.4 (1-50)	8	33.3 (1-60)	0.71
C8/C6	15	27.7 (1-40)	7	33.3 (1-70)	0.39
Final visit	14	33.3 (1-70)	6	14.2 (1-60)	0.29
Constipation					
Baseline	17	25.4 (20-40)	9	11.1 (1-40)	0.20
C3/C4	17	29.4 (10-40)	8	23.3 (1-40)	0.62
C6/C8	15	20.0 (10-30)	7	25.0 (1-30)	0.68
Final visit	14	40.4 (20-60)	6	9.5 (1-20)	0.01
Diarrhea					
Baseline	17	17.6 (10-20)	9	14.8 (1-30)	0.79
C4/C3	17	19.6 (10-30)	8	14.2 (1-30)	0.53
C8/C6	15	22.2 (10-30)	7	20.8 (1-30)	0.98
Final visit	14	38.1 (30-40)	6	9.5 (1-20)	0.09
Financial difficulties (%)					
Baseline	17	25.4 (10-40)	9	25.9 (10-70)	0.92
C4/C3	17	33.3 (20-50)	8	33.3 (10-70)	0.99
C8/C6	15	37.5 (20-50)	7	37.5 (10-70)	0.47
Final visit	14	34.2 (10-50)	6	34.2 (10-60)	0.32

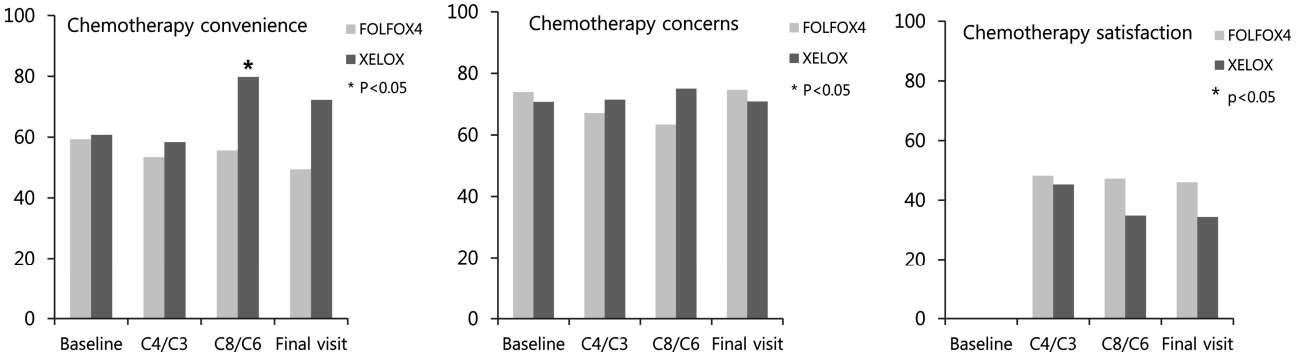

Fig. 2. FACIT-CCSQ assessments of chemotherapy convenience, concerns, and satisfaction in patients receiving either FOLFOX4 or XELOX.

health-care satisfaction between colon cancer patients treated with different adjuvant chemotherapy regimens (FOLFOX4 and XELOX).

At the study end point, the survival rate of all patients was 100 percent and there were no recurrences in either group. Under the assumption that the effects of both chemotherapy regimens were similar, the XELOX group exhibited better functional scores and symptom scores at the final visit than the FOLFOX4 group according to the EORTC QLQ-C30. According to the EORTC-CIPN20, at the C6/C8 visit, XELOX patients had lower motor scale scores than FOLFOX4 patients. Patients in the XELOX group reported better convenience than did patients in the FOLFOX4 group according to the FACIT-CCSQ.

Table 3. EORTC QLQ-C30 assessments in patients aged <70 years

EORTC QLQ-C30	FOLFOX4 group, n=9		XELOX group, n=9		p-value
	n	Median (min-max)	n	Median (min-max)	
Physical functioning (%)					
Baseline	9	83.7 (70-100)	9	86.6 (70-100)	0.93
C4/C3	9	83.7 (70-100)	8	88.5 (70-100)	0.47
C8/C6	8	82.5 (70-100)	7	86.6 (70-100)	0.72
Final visit	8	72.9 (50-80)	6	85.7 (70-100)	0.23
Role functioning (%)					
Baseline	9	79.6 (50-100)	9	85.1 (70-100)	0.73
C4/C3	9	77.7 (60-90)	8	78.5 (70-100)	0.76
C8/C6	8	79.1 (60-90)	7	81.2 (70-100)	0.88
Final visit	8	70.8 (50-80)	6	83.3 (70-100)	0.23
Cognitive functioning (%)					
Baseline	9	79.6 (40-100)	9	81.4 (65-100)	0.60
C4/C3	9	83.3 (50-100)	8	88.5 (70-100)	0.99
C8/C6	8	77.0 (50-90)	7	85.4 (70-100)	0.79
Final visit	8	87.2 (60-100)	6	90.4 (75-100)	0.62
Emotional functioning (%)					
Baseline	9	81.4 (60-100)	9	86.1 (70-100)	0.79
C4/C3	9	75.5 (50-100)	8	79.7 (65-100)	0.75
C8/C6	8	85.4 (70-100)	7	79.1 (60-100)	0.87
Final visit	8	75.0 (50-100)	6	86.9 (70-100)	0.21
Social functioning (%)					
Baseline	9	77.7 (50-100)	9	70.3 (50-100)	0.60
C4/C3	9	74.0 (50-100)	8	78.5 (50-100)	0.69
C8/C6	8	68.8 (50-100)	7	68.7 (50-100)	0.95
Final visit	8	80.2 (60-100)	6	83.3 (60-100)	0.86
Global quality of life scale (%)					
Baseline	9	65.7 (40-100)	9	61.1 (40-100)	0.73
C4/C3	9	67.6 (40-100)	8	63.1 (40-100)	0.99
C8/C6	8	78.1 (50-100)	7	72.9 (50-100)	0.72
Final visit	8	59.3 (40-100)	6	69.0 (50-100)	0.39
Fatigue (%)					
Baseline	9	35.8 (1-60)	9	28.3 (1-40)	0.79
C4/C3	9	30.8 (15-60)	8	34.9 (1-50)	0.83
C8/C6	8	31.9 (15-50)	7	36.1 (1-50)	0.72
Final visit	8	20.8 (5-40)	6	26.9 (1-50)	0.46
Nausea and vomiting (%)					
Baseline	9	7.4 (1-20)	9	3.7 (1-20)	0.73
C4/C3	9	18.5 (1-20)	8	21.4 (1-30)	0.99
C8/C6	8	18.7 (1-30)	7	18.7 (1-30)	0.79
Final visit	8	25.0 (1-40)	6	11.9 (1-30)	0.33
Pain (%)					
Baseline	9	14.8 (1-30)	9	20.3 (1-40)	0.60
C4/C3	9	9.2 (1-30)	8	19.5 (1-20)	0.60
C8/C6	8	16.6 (1-40)	7	12.5 (1-30)	0.87
Final visit	8	25.0 (1-40)	6	11.9 (1-30)	0.33
Dyspnea (%)					
Baseline	9	11.1 (1-30)	9	7.4 (1-20)	0.73
C4/C3	9	11.1 (1-40)	8	9.5 (1-20)	0.91
C8/C6	8	16.6 (1-40)	7	8.3 (1-20)	0.95
Final visit	8	14.5 (1-40)	6	19.0 (1-30)	0.83

Table 3. EORTC QLQ-C30 assessments in patients aged <70 years (continued)

EORTC QLQ-C30	FOLFOX4 group, n=9		XELOX group, n=9		p-value
	n	Median (min-max)	n	Median (min-max)	
Insomnia (%)					
Baseline	9	37.0 (1-40)	9	18.5 (1-40)	0.22
C4/C3	9	14.8 (1-40)	8	19.0 (1-40)	0.60
C8/C6	8	33.3 (1-50)	7	29.1 (1-50)	0.95
Final visit	8	16.6 (1-40)	6	14.2 (1-50)	0.98
Appetite loss (%)					
Baseline	9	7.4 (1-40)	9	25.9 (1-50)	0.34
C4/C3	9	29.6 (1-50)	8	33.3 (1-60)	0.99
C8/C6	8	16.6 (1-40)	7	33.3 (1-70)	0.44
Final visit	8	20.8 (1-60)	6	14.2 (1-60)	0.95
Constipation					
Baseline	9	25.9 (20-40)	9	11.1 (1-40)	0.19
C3/C4	9	22.2(10-40)	8	23.3 (1-40)	0.40
C6/C8	8	25.0 (10-30)	7	25.0 (1-30)	0.95
Final visit	8	37.5 (20-60)	6	9.5 (1-20)	0.01
Diarrhea					
Baseline	9	12.2 (10-20)	9	14.8 (1-30)	0.48
C4/C3	9	18.5 (10-30)	8	14.2 (1-30)	0.83
C8/C6	8	16.6 (10-20)	7	20.8 (1-30)	0.72
Final visit	8	35.8 (30-40)	6	9.5 (1-20)	0.05
Financial difficulties (%)					
Baseline	9	22.2 (10-40)	9	25.9 (10-70)	0.99
C4/C3	9	18.8 (20-40)	8	33.3 (10-70)	0.53
C8/C6	8	25.0 (20-40)	7	37.5 (10-70)	0.57
Final visit	8	25.0 (10-50)	6	34.2 (10-60)	0.46

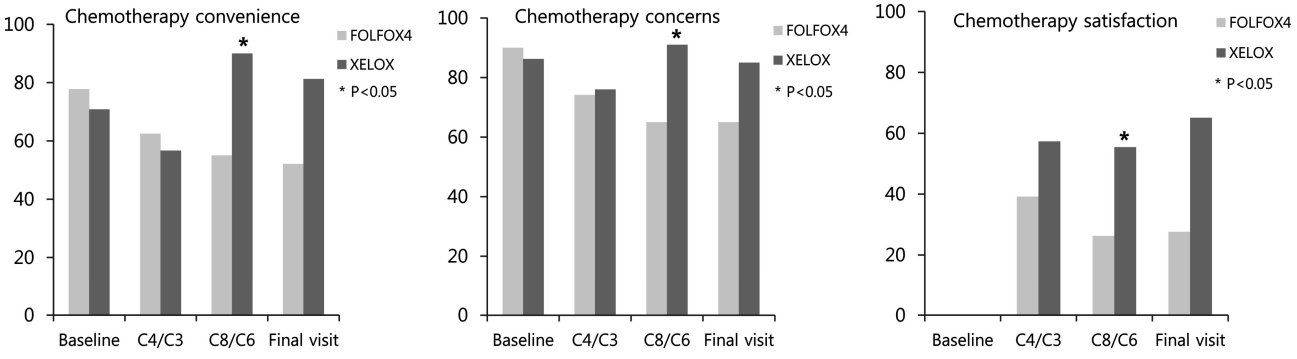

Fig. 3. FACIT-CCSQ assessments of chemotherapy convenience, concerns, and satisfaction in male patients receiving either FOLFOX4 or XELOX.

In one previous study, no differences were detected between metastatic colon cancer patients treated with XELOX and FOLFOX-6 using QLQ-C3010. Also, in a 2007 study, Kopec et al. studied QoL in stage II/III colon cancer patients treated with oral uracil/tegafur (UFT) plus LV and standard intravenous 5-FU/LV as adjuvant chemotherapy and found that patient QoL did not differ between regimens.[14] In contrast, in the present study, we found that the QLQ-C30 scores were significantly different between treatment groups and that XELOX was preferred by patients due to its convenience. In our study, the total dose of oxaliplatin was not differed in both groups. Although, it was meaningful that XELOX had lower motor scale scores than those treated with FOLFOX4. This result is consistent with those of other

Table 4. EORTC QLQ-C30 assessments in male patients

EORTC QLQ-C30	FOLFOX4 group, n=6		XELOX group, n=6		p-value
	n	Median (min-max)	n	Median (min-max)	
Physical functioning (%)					
Baseline	6	81.1 (60-100)	6	88.5 (80-100)	0.94
C4/C3	6	72.2 (60-100)	6	89.3 (80-100)	0.12
C8/C6	5	70.6 (50-100)	5	87.7 (80-100)	0.17
Final visit	4	78.0 (65-80)	4	84.0 (70-100)	0.73
Role functioning (%)					
Baseline	6	75.0 (50-100)	6	88.1 (70-100)	0.73
C4/C3	6	66.6 (40-90)	6	76.6 (70-100)	0.42
C8/C6	5	56.6 (40-90)	5	83.3 (70-100)	0.12
Final visit	4	66.6 (50-80)	4	86.6 (70-100)	0.19
Cognitive functioning (%)					
Baseline	6	88.8 (70-100)	6	85.7 (70-100)	0.83
C4/C3	6	86.1 (60-100)	6	86.6 (70-100)	0.66
C8/C6	5	83.3 (60-90)	5	88.8 (70-100)	0.93
Final visit	4	90.0 (80-100)	4	93.3 (80-100)	0.17
Emotional functioning (%)					
Baseline	6	84.7 (60-100)	6	94.0 (80-100)	0.29
C4/C3	6	66.9 (60-90)	6	86.6 (70-100)	0.32
C8/C6	5	75.0 (70-90)	5	93.0 (80-100)	0.08
Final visit	4	70.8 (60-100)	4	96.6 (90-100)	0.28
Social functioning (%)					
Baseline	6	80.5 (50-100)	6	66.6 (50-100)	0.29
C4/C3	6	55.5 (40-100)	6	83.3 (60-100)	0.17
C8/C6	5	70.0 (60-100)	5	75.0 (60-100)	0.79
Final visit	4	87.4 (70-100)	4	80.0 (60-100)	0.73
Global quality of life scale (%)					
Baseline	6	63.8 (50-90)	6	69.0 (50-100)	0.53
C4/C3	6	58.3 (40-90)	6	76.6 (60-100)	0.12
C8/C6	5	61.6 (40-90)	5	81.9 (60-100)	0.12
Final visit	4	66.6 (50-90)	4	75.0 (60-100)	0.55
Fatigue (%)					
Baseline	6	27.0 (1-50)	6	29.6 (10-40)	0.62
C4/C3	6	42.6 (10-50)	6	31.1 (20-40)	0.53
C8/C6	5	37.7 (20-50)	5	35.1 (20-50)	0.99
Final visit	4	21.0 (1-40)	4	24.4 (1-40)	0.96
Nausea and vomiting (%)					
Baseline	6	5.5 (1-20)	6	2.0 (1-10)	0.62
C4/C3	6	13.8 (1-20)	6	10.0 (1-20)	0.66
C8/C6	5	30.0 (1-40)	5	13.8 (1-20)	0.17
Final visit	4	16.6 (1-40)	4	3.3 (1-10)	0.11
Pain (%)					
Baseline	6	13.8 (3-40)	6	19.0 (1-40)	0.73
C4/C3	6	22.2 (10-40)	6	16.6 (1-20)	0.66
C8/C6	5	23.3 (1-40)	5	9.7 (1-10)	0.17
Final visit	4	25.0 (1-40)	4	13.3 (1-30)	0.41
Dyspnea (%)					
Baseline	6	16.6 (1-40)	6	14.2 (1-20)	0.29
C4/C3	6	22.2 (1-40)	6	15.0 (1-20)	0.66
C8/C6	5	26.6 (1-40)	5	16.6 (1-20)	0.42
Final visit	4	10.1 (1-30)	4	13.3 (1-30)	0.57

Table 4. EORTC QLQ-C30 assessments in male patients (continued)

EORTC QLQ-C30	FOLFOX4 group, n=6		XELOX group, n=6		p-value
	n	Median (min-max)	n	Median (min-max)	
Insomnia (%)					
Baseline	6	11.1 (1-30)	6	9.5 (1-30)	0.94
C4/C3	6	33.3 (1-50)	6	13.3 (1-30)	0.53
C8/C6	5	33.3 (1-50)	5	22.2 (1-40)	0.66
Final visit	4	8.3 (1-50)	4	16.6 (1-40)	0.57
Appetite loss (%)					
Baseline	6	5.5 (1-30)	6	14.2 (1-50)	0.73
C4/C3	6	27.7 (1-50)	6	20.0 (1-40)	0.66
C8/C6	5	19.9 (1-40)	5	27.7 (1-50)	0.99
Final visit	4	16.6 (1-40)	4	10.0 (1-40)	0.28
Constipation (%)					
Baseline	6	22.2 (20-40)	6	10.0 (1-20)	0.13
C3/C4	6	25.5 (10-30)	6	20.0 (1-40)	0.32
C6/C8	5	26.6 (10-30)	5	16.6 (1-30)	0.66
Final visit	4	30.5 (20-60)	4	6.6 (1-20)	0.06
Diarrhea (%)					
Baseline	6	16.6 (10-20)	6	14.2 (1-30)	0.94
C4/C3	6	16.6 (10-30)	6	20.0 (1-30)	0.66
C8/C6	5	13.3 (10-30)	5	16.6 (1-30)	0.79
Final visit	4	30.6 (30-40)	4	13.3 (1-20)	0.90
Financial difficulties (%)					
Baseline	6	33.3 (10-40)	6	23.8 (10-70)	0.83
C4/C3	6	44.4 (20-50)	6	26.6 (10-70)	0.66
C8/C6	5	26.6 (20-50)	5	38.8 (10-70)	0.42
Final visit	4	25.0 (10-50)	4	13.3 (10-60)	0.90

studies.[15,16] In 2006, Twelves et al. studied QoL in advanced or metastatic colon cancer patients treated with capecitabine followed by intravenous 5-FU/LV or intravenous 5-FU/ LV followed by capecitabine. They found that the majority of patients with metastatic cancer preferred oral therapy.[16]

In our study, QoL was better in the XELOX group than in the FOLFOX4 group, perhaps due to differences in patient age between groups. There were no patients aged ≥70 years of age in the XELOX group, while eight patients of 17, or nearly 50 percent of patients in the FOLFOX-4 group were over 70. It is possible that elderly patients have lower expectations for effect, convenience and satisfaction regarding chemotherapy and additionally have more side effects of chemotherapy. Most studies of QoL among elderly colon cancer patients report declines in QoL with age.[17-22]

Moreover, we thought that difference of results between both groups was possible due to small sample size. In previous studies involved more than 100 patients, patient QoL did not differ between regimens.

This study has some limitations. First, the sample size was very small and 6 patients out of 26 were dropped due to chemotherapy regimen changes, general weakness or refusal. Second, our results might be influenced by selection bias, as patients selected for adjuvant chemotherapy might have been relatively healthy and the two groups were not randomly assigned. Third, patients might accept a certain amount of side effects that negatively impact QoL, because of the treatment outcomes related to this therapy and education before treatment.

CONCLUSIONS

Although this study has some limitations, we successfully detected differences in QoL and convenience between colon cancer patients treated with two different chemotherapy regimens. In conclusion, XELOX may be a better adjuvant chemotherapy choice for patients with colon cancer than FOLFOX4 in terms of QoL, convenience, and satisfaction. Additionally, a randomized study using larger patient samples will be needed in the future.

Table 5. EORTC QLQ-C30 assessments in female patients

EORTC QLQ-C30	FOLFOX4 group, n=11		XELOX group, n=3		p-value
	n	Median (min-max)	n	Median (min-max)	
Physical functioning (%)					
Baseline	11	77.5 (50-100)	3	84.4 (70-100)	0.65
C4/C3	11	74.5 (50-100)	2	86.6 (73-100)	0.41
C8/C6	10	73.3 (50-100)	2	83.3 (70-96)	0.60
Final visit	10	54.0 (50-100)	2	90.0 (80-100)	0.01
Role functioning (%)					
Baseline	11	77.2 (50-100)	3	83.3 (70-100)	0.99
C4/C3	11	68.1 (40-90)	2	83.3 (70-96)	0.41
C8/C6	10	75.0 (40-90)	2	75.0 (70-80)	0.99
Final visit	10	53.3 (40-80)	2	75.0 (70-80)	0.36
Cognitive functioning (%)					
Baseline	11	74.2 (60-100)	3	77.7 (65-100)	0.88
C4/C3	11	80.3 (70-100)	2	91.6 (83-100)	0.64
C8/C6	10	76.6 (60-90)	2	75.0 (70-80)	0.75
Final visit	10	71.6 (50-100)	2	75.0 (70-80)	0.36
Emotional functioning (%)					
Baseline	11	82.5 (75-100)	3	72.2 (70-100)	0.36
C4/C3	11	84.8 (60-100)	2	62.5 (65)	0.51
C8/C6	10	87.5 (70-100)	2	67.5 (60-75)	0.06
Final visit	10	71.6 (60-100)	2	75.0 (70-80)	0.80
Social functioning (%)					
Baseline	11	77.2 (50-100)	3	77.7 (50-100)	0.88
C4/C3	11	77.2 (40-100)	2	66.6 (50-83)	0.51
C8/C6	10	73.3 (50-100)	2	50.0 (50)	0.36
Final visit	10	81.6 (60-100)	2	66.6 (60-73)	0.18
Global quality of life scale (%)					
Baseline	11	63.6 (40-100)	3	44.4 (40-100)	0.47
C4/C3	11	58.3 (40-100)	2	49.1 (40-58)	0.30
C8/C6	10	63.3 (40-100)	2	55.0 (50-60)	0.36
Final visit	10	55.0 (40-100)	2	54.1 (50-58)	0.99
Fatigue (%)					
Baseline	11	37.3 (1-60)	3	33.3 (1-40)	0.99
C4/C3	11	29.2 (1-60)	2	44.4 (39-50)	0.30
C8/C6	10	32.2 (10-50)	2	38.8 (27-50)	0.60
Final visit	10	16.6 (1-40)	2	33.3 (17-50)	0.27
Nausea and vomiting (%)					
Baseline	11	10.6 (1-20)	3	11.1 (1-30)	0.99
C4/C3	11	13.6 (1-20)	2	22.0 (20-24)	0.15
C8/C6	10	18.3 (1-40)	2	23.3 (16-30)	0.36
Final visit	10	20.0 (1-40)	2	25.3 (20-30)	0.48
Pain (%)					
Baseline	11	25.7 (1-40)	3	16.6 (2-30)	0.65
C4/C3	11	15.1 (1-40)	2	16.6 (16-20)	0.51
C8/C6	10	25.0 (1-40)	2	11.6 (2-20)	0.48
Final visit	10	16.6 (1-40)	2	19.6 (9-30)	0.36
Dyspnea (%)					
Baseline	11	15.1 (1-40)	3	11.1 (2-20)	0.88
C4/C3	11	18.1 (1-40)	2	7.5 (5-10)	0.51
C8/C6	10	26.6 (1-40)	2	16.6 (12-20)	0.90
Final visit	10	25.0 (1-40)	2	16.6 (12-20)	0.65

Table 5. EORTC QLQ-C30 assessments in female patients (continued)

EORTC QLQ-C30	FOLFOX4 group, n=11		XELOX group, n=3		p-value
	n	Median (min-max)	n	Median (min-max)	
Insomnia (%)					
Baseline	11	30.3 (1-50)	3	33.3 (2-40)	0.88
C4/C3	11	27.2 (1-50)	2	33.3 (26-40)	0.64
C8/C6	10	26.6 (1-50)	2	35.0 (20-50)	0.36
Final visit	10	16.6 (1-50)	2	16.6 (13-20)	0.75
Appetite loss (%)					
Baseline	11	18.1 (1-40)	3	34.4 (1-50)	0.36
C4/C3	11	24.2 (1-50)	2	36.6 (38-40)	0.23
C8/C6	10	16.6 (1-40)	2	35.0 (70)	0.12
Final visit	10	40.0 (1-70)	2	50.0 (40-60)	0.75
Constipation (%)					
Baseline	11	27.2 (20-40)	3	33.3 (1-40)	0.99
C3/C4	11	15.1 (10-40)	2	36.6 (32-40)	0.10
C6/C8	10	16.6 (10-30)	2	30.0 (30)	0.12
Final visit	10	44.4 (20-60)	2	16.6 (13-20)	0.18
Diarrhea (%)					
Baseline	11	18.1 (10-20)	3	22.2 (1-30)	0.99
C4/C3	11	21.2 (10-30)	2	11.0 (2-20)	0.41
C8/C6	10	23.3 (10-30)	2	22.3 (14-30)	0.60
Final visit	10	36.6 (30-40)	2	10.0 (10)	0.18
Financial difficulties (%)					
Baseline	11	21.2 (10-40)	3	32.3 (10-70)	0.93
C4/C3	11	27.2 (20-50)	2	50.0 (30-50)	0.76
C8/C6	10	30.0 (20-50)	2	33.3 (30-36)	0.90
Final visit	10	30.0 (10-50)	2	16.6 (10-24)	0.48

Table 6. EORTC QLQ-CIPN20 assessments for the QLQ-CIPN20 set

EORTC QLQ-CIPN20	FOLFOX4 group, n=17	XELOX group, n=9	p-value
	Median (min-max)	Median (min-max)	
Sensory scale (%)			
Baseline	2.1 (1-10)	5.3 (1-15)	0.71
C4/C3	16.1 (1-30)	21.1 (1-40)	0.66
C8/C6	24.2 (1-50)	13.0 (1-30)	0.19
Final visit	49.7 (10-70)	40.2 (10-60)	0.40
Motor scale (%)			
Baseline	8.0 (1-20)	5.2 (1-10)	0.95
C4/C3	19.8 (1-30)	8.9 (1-20)	0.18
C8/C6	21.6 (1-40)	3.8 (1-10)	0.02
Final visit	43.4 (10-70)	19.3 (1-40)	0.06
Autonomic scale (%)			
Baseline	21.2 (1-50)	19.7 (1-30)	0.63
C4/C3	28.1 (1-50)	21.4 (1-40)	0.71
C8/C6	29.2 (1-50)	22.9 (10-30)	0.54
Final visit	25.0 (1-50)	15.0 (1-30)	0.28

Table 7. FACIT-CCSQ questionnaire assessments in the FACIT-CCSQ set

FACIT-CCSQ	FOLFOX4 group, n=17		XELOX group, n=9		p-value
	n	Median (min-max)	n	Median (min-max)	
Within past week					
Hospital visits					
C4/C3	16	2.0 (1-4)	8	1.2 (1-2)	0.76
C8/C6	15	1.4 (1-3)	8	1.1 (1-2)	0.39
Final visit	13	1.0 (1-2)	7	1.1 (1-2)	0.31
Emergency room admissions					
C4/C3	16	0.5 (0-1)	8	0.0 (0)	0.82
C8/C6	15	0.2 (0-1)	8	0.0 (0)	0.46
Final visit	13	0.1 (0-1)	7	0.1 (0-1)	0.81
Physician visits					
C4/C3	16	1.3 (1-3)	8	1.1 (1-2)	0.67
C8/C6	15	1.2 (1-3)	8	1.2 (1-2)	0.63
Final visit	13	1.0 (1-2)	7	1.0 (1-1)	0.99
Number of days for a usual hospital visit?					
C4/C3	16	4.25 (3-5)	8	2.8 (2-3)	0.01
C8/C6	15	4.1 (3-5)	8	2.7 (1-3)	0.01
Final visit	13	4.5 (3-5)	7	3.0 (2-4)	0.01
Number of hours for a usual emergency room admission?					
C4/C3	16	0.5 (0-1)	8	0.0 (0)	0.89
C8/C6	15	0.5 (0-1)	8	0.0 (0)	0.82
Final visit	13	1.0 (0-2)	7	0.8 (0-2)	0.87
Number of hours for a usual physician visit within past cycle?					
C4/C3	16	2.0 (1-4)	8	1.2 (0.5-2)	0.49
C8/C6	15	2.1 (1-4)	8	1.6 (0.5-3)	0.59
Final visit	13	1.8 (1-4)	7	1.5 (0.5-3)	0.75
How many days have you lost for your work or usual daily activities?					
C4/C3	16	2.7 (1-4)	8	3.4 (1-4)	0.67
C8/C6	15	2.8 (1-4)	8	1.6 (0-3)	0.19
Final visit	13	3.0 (1-4)	7	1.5 (0-3)	0.13
How many days have your friends or your family lost for their work or usual daily activities?					
C4/C3	16	1.5 (0-3)	8	2.2 (0-4)	0.82
C8/C6	15	0.8 (0-3)	8	0.04 (0-1)	0.14
Final visit	13	0.7 (0-2)	7	0.01 (0-1)	0.18

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