

QUALITY OF LIFE IN TREATMENT OF ACUTE RHINOSINUSITIS: CEFDITOREN PIVOXIL VERSUS MOXIFLOXACINE

AKUT RİNOSİNÜZİT TEDAVİSİNDE HAYAT KALİTESİ: SEFDİTOREN PİVOKSİL'E KARŞI MOKSİFLOKSASİN

Dr. Nuray Bayar Muluk¹, Dr. İlker Ağaoğlu², Dr. Osman Kürşat Arkan³

ARAŞTIRMA

ÖZET

Amaç: Bu prospektif çalışma, Cefditoren pivoxil (Spectracef®) veya Moksifloksasin (Avelox®) ile tedavi edilen akut rinosinüzitli (ARS) hastalarda , kontrol grubu ile karşılaştırmalı olarak, SF-36 sağlık anketi ile çok-başlıklı sağlık konularını araştırmaktadır.

Hastalar ve Yöntemler: Çalışma grubu, ARS olan 20 erişkin hastadan oluşmuştur ve bu hastalar randomize olarak iki gruba bölünmüştür. Grup 1'deki hastalara, 10 gün süre ile Sefditoren pivoksil (Spectracef tablet®, 200 mg, günde iki kez); ve grup 2'deki hastalara, 7 gün süre ile Moksifloksasin (Avelox®, 400 mg, günde tek doz) verilmiştir. Kontrol grubu, 10 sağlıklı kişiden oluşmuştur. SF-36 anketi ile, sekiz sağlık konsepti, başlangıç (In) ve sonrası (Ar) dönemlerinde değerlendirilmiş; ve kazanç (g) değerleri bulunmuştur. Bu başlıklar, fiziksel fonksiyon (PF), fiziksel problemler nedeni ile olan kısıtlılıklar (RP), sosyal fonksiyon (SF), vücutta ağrı (BP), genel mental sağlık (MH), emosyonel problemler nedeni ile olan kısıtlılıklar (RE), vitalite (VT) ve genel sağlık durumudur (GH).

Bulgular: Sefditoren pivoksil grubunda, RE, VT ve GH başlıklarında, hayat kalitesi (QOL) sonuçları Ar döneminde anlamlı olarak artmıştır; ve RP-g, BP-g ve VT-g değerleri, kontrol grubundan daha yüksektir. Moksifloksasin grubunda, BP-Ar değeri, kontrol grubuna göre anlamlı şekilde daha düşüktür. Yaşlı hastalar, son yılda daha fazla sayıda ARS atağı geçirenler ve septal deviasyonu olanlarda, SF-36 kazanç skorları, her iki grupta da azalmıştır.

Sonuç: Sefditoren pivoksil ve Moksifloksasin'in herikisi de ARS'in tedavisinde etkilidir. ARS olan hastalarda, ileri yaş, daha fazla ARS atağı ve septal deviasyon, QOL'i düşürebilir. Bu risk faktörleri olan hastalarda, komplikasyonları mümkün olan en kısa sürede tespit etmek için, hastaların kontrolleri sık aralarla yapılmalıdır.

Anahtar kelimeler: Akut rinosinüzit (ARS), sefditoren pivoksil, moksifloksasin, SF-36 sağlık anketi, hayat kalitesi (QOL).

İletişim:

Dr. Nuray Bayar Muluk
Birlik Mahallesi, Zirvekent 2. Etap Sitesi, C-3 blok, No: 62/43
06610 Çankaya / ANKARA / TURKEY
Tel: +90 312 4964073 , +90 532 7182441
Fax: +90 318 2252819
e-mail: nbayarmuluk@yahoo.com / nurayb@hotmail.com

RESEARCH

ABSTRACT

Aim: This prospective study investigated multi-item health concepts by SF-36 Health Survey in patients with acute rhinosinusitis (ARS) treated by Cefditoren pivoxil (Spectracef®) or Moxifloxacin (Avelox®) comparing with the control group.

Patients and Methods: The study group consisted of 20 adult patients with ARS which was randomizedly divided into two groups. Group 1 patients were given Cefditoren pivoxil (Spectracef tablet®, 200 mg, twice a day) for 10 days and group 2 patients were given Moxifloxacin (Avelox®, 400 mg, once a day) for 7 days. Control group consisted 10 healthy subjects. Using SF-36 questionnaire, eight health concepts were evaluated at initial (In), after (Ar) periods; and gain (g) values were found. These domains are physical functioning (PF), role limitations due to physical problems (RP), social functioning (SF), bodily pain (BP), general mental health (MH), role limitations due to emotional problems (RE), vitality (VT) and general health perceptions (GH).

Results: In Cefditoren pivoxil group, at RE, VT and GH domains, quality of life (QOL) results significantly increased at the Ar period; and RP-g, BP-g and VT-g values were higher than the control group. In moxifloxacin group, BP-Ar value were significantly lower than the control group. In patients with older age, higher number of ARS attacks for last per year and presence of septal deviation, SF-36-gain scores were impaired in both groups.

Conclusion: Cefditoren pivoxil and Moxifloxacin are both effective in treating ARS. In patients with ARS, older age, higher ARS attacks and septal deviation may impair QOL. Control visits of the patients must be very closely in patients with these risk factors in order to detect any complications as soon as possible.

Key words: Acute rhinosinusitis (ARS), cefditoren pivoxil, moxifloxacin, SF-36 health survey, quality of life (QOL).

¹ Professor, Kırıkkale University, Faculty of Medicine, ENT Department

² Assistant doctor in Kırıkkale University, Faculty of Medicine, ENT Department

³ Associate Professor, Kırıkkale University, Faculty of Medicine, ENT Department

INTRODUCTION

Acute sinusitis, defined as disease lasting less than 1 month, is the fifth most common diagnosis prompting antibiotic administration and accounts for 0.4% of ambulatory diagnosis (1,2). It is treated medically and upward of 45% of cases would resolve spontaneously if left untreated (1,3). Despite the high incidence of spontaneous resolution, most patients are treated empirically with antibiotics because it is nearly impossible to determine who would resolve without antibiotics (4). Initial selection of the appropriate antibiotic therapy should be based on the likely causative organisms given the clinical scenario and the probability of resistant strains within a community (2).

There are a large number of antibiotics used for the treatment of ARS in adults; and Cefditoren⁵ and moxifloxacin are two groups of these antibiotics (4). Cefditoren pivoxil (Spectracef[®]) is a third-generation oral cephalosporin with a broad spectrum of activity against pathogens, including both Gram-positive and -negative bacteria, and is stable to hydrolysis by many common beta-lactamases (6,7). Moxifloxacin (Avelox[®]) is a fourth-generation fluoroquinolone that has been shown to be effective against respiratory pathogens, including Gram-positive (*Streptococcus pneumoniae*), Gram-negative (*Haemophilus influenzae*, *Moraxella catarrhalis*), and atypical strains (*Chlamydia pneumoniae*, *Mycoplasma pneumoniae*), as well as multi-drug resistant *S. pneumoniae*, including strains resistant to penicillin, macrolides, tetracyclines, trimethoprim/sulfamethoxazole and some fluoroquinolones (8).

The SF-36 Health Survey is a multi-item global assessment of patient functions (9). The SF-36 measures eight concepts, called domains. Each domain represented by a series of questions (or items) (10). It assesses eight health concepts including physical functioning (10 items), role limitations due to physical problems (four items), bodily pain (two items), general mental health (five items), role limitations due to emotional problems (three items), vitality (four items), and general health perceptions (six items). Each scale yields a score of 0-100, with lower scores reflecting greater limitations in function (11).

In the present study, we investigated multi-item patient functions of health concepts by SF-36 Health Survey in patients with acute rhinosinusitis treated by cefditoren pivoxil (Spectracef[®]) or moxifloxacin (Avelox[®]) comparing with the control group. In the literature survey, we could not find any similar quality of life (QOL) study with the same antibiotics.

PATIENTS AND METHODS

The study was assessed in the Ear Nose Throat (ENT) Department of Kirikkale University Faculty of Medicine.

Subjects

The acute rhinosinusitis (ARS) patients were selected from the patients examined in the Otolaryngology Department of Kirikkale University Faculty of Medicine. The diagnosis of ARS was made according to the criteria which were outlined in the clinical practice guidelines developed by the Sinus and Allergy Health Partnership¹². The study group consisted of 20 adult patients which were randomizedly divided into two groups. Group 1 consisted of 10 patients (10 female). Their ages were between 24 and 51; and the mean age was 35.7 ± 9.91 . Group 2 consisted of 10 patients (3 male, 7 female). Their ages were between 21 and 59; and the mean age was 36.4 ± 12.02 .

All patients in the study group were examined with questionnaire; ENT examination; endoscopic examination with 0° and 30° endoscopes; Waters' graphy; routine hemograms; and if necessary, axial and coronal CT of paranasal sinuses. Using SF-36 questionnaire, quality of the life of patients in both groups.

Even though, treatment duration of acute rhinosinusitis was reported as between 10-14 days with different antibiotics (4); group 1 patients were given cefditoren pivoxil (Spectracef tablet[®], 200 mg, twice a day) for 10 days (13,14) and group 2 patients were given moxifloxacin (Avelox[®], 400 mg, once a day) for seven days (15,16). For acute sinusitis, dosage regimen and the treatment duration were arranged according to the prospectuses of both antibiotics which were approved by Turkish Ministry of Health. The recommended doses of cefditoren pivoxil and moxifloxacin in their prospectuses for acute sinusitis were given to the patients without any changes.

After the treatment, the patients were evaluated by ENT examination, Waters' graphy and SF-36 Health Survey again.

Control group

The control group consisted of 10 healthy subjects (3 male, 7 female) without ARS. Their ages were between 26 and 46; and the mean age was 34.5 ± 7.27 . They were evaluated by SF-36 Survey twice, at the initial stage (In) and 10 day after that time (Ar).

All patients in the study and control groups accepted to enter the study with written and signed approval of them. Patients with chronic diseases were excluded from the study.

Instrumentation

1. Questionnaire: In questionnaire form, anterior and posterior nasal discharge, nasal congestion, cough, facial and dental pain, halitosis, paroxysmal nocturnal coughing spells, sore throat, fever, olfactory loss, headache and ear pain (17); and ARS attacks in last year were asked.

Table 1 - SF-36 Health Survey results of the Cefditoren pivoxil, Moxifloxacin and control groups (Initial, after and gain)*

SF-36 Domains**	Cefditoren Pivoxil Group (Mean±St Dev)					Moxifloxacin Group (Mean±St Dev)					Control Group (Mean±St Dev)					Kruskal Wallis Variance Analysis			
	Initial	After	Gain	P†	Initial	After	Gain	P†	Initial	After	Gain	P†	Initial	After	Gain	P†	p Initial	p After	p Gain
PF	69.00 ± 22.08	76.00 ± 21.83	7.50 ± 22.14	0.572	79.00 ± 27.56	78.00 ± 25.29	-1.00 ± 5.16	0.577	95.00 ± 8.81	95.00 ± 8.81	0.00 ± 0.00	1.000	95.00 ± 8.81	95.00 ± 8.81	0.00 ± 0.00	1.000	0.004	0.040	0.187
RP	45.83 ± 38.33	80.00 ± 25.81	34.16 ± 52.33	0.092	45.00 ± 43.77	45.00 ± 48.30	-1.33 ± 44.09	0.891	85.00 ± 21.08	82.5 ± 20.58	2.50 ± 7.90	0.317	85.00 ± 21.08	82.5 ± 20.58	2.50 ± 7.90	0.317	0.039	0.190	0.029
SF	51.25 ± 25.31	63.75 ± 24.61	17.5 ± 28.98	0.234	67.50 ± 27.13	63.75 ± 29.72	-3.75 ± 22.08	0.680	82.5 ± 20.58	781.2 ± 19.76	2.25 ± 7.11	0.317	82.5 ± 20.58	781.2 ± 19.76	2.25 ± 7.11	0.317	0.031	0.197	0.140
BP	39.47 ± 17.78	63.5 ± 27.84	31.02 ± 31.74	0.068	55.97 ± 25.38	47.00 ± 30.56	-1.97 ± 29.17	0.362	80.75 ± 13.43	80.75 ± 13.43	0.00 ± 4.71	1.000	80.75 ± 13.43	80.75 ± 13.43	0.00 ± 4.71	1.000	0.002	0.038	0.009
MH	41.20 ± 25.51	50.00 ± 27.53	5.60 ± 36.91	0.594	52.40 ± 23.73	46.00 ± 25.38	-6.40 ± 16.46	0.178	68.80 ± 17.46	68.80 ± 17.46	0.40 ± 2.27	0.564	68.80 ± 17.46	68.80 ± 17.46	0.40 ± 2.27	0.564	0.042	0.116	0.551
RE	39.99 ± 34.42	73.33 ± 30.63	33.33 ± 44.44	0.041	46.66 ± 50.18	53.33 ± 44.99	20.0 ± 35.83	0.593	76.66±41 .72	76.66±41 .72	0.00±0.0 0	1.000	76.66±41 .72	76.66±41 .72	0.00±0.0 0	1.000	0.143	0.408	0.069
VT	29.50 ± 23.02	50.00 ± 25.81	20.00 ± 28.57	0.021	41.50 ± 23.33	37.00 ± 24.51	-4.50 ± 17.07	0.574	62.5 ± 18.74	61.5 ± 17.48	1.00 ± 2.10	0.157	62.5 ± 18.74	61.5 ± 17.48	1.00 ± 2.10	0.157	0.014	0.076	0.023
GH	45.82 ± 22.73	58.74 ± 18.05	12.91 ± 23.27	0.043	56.24 ± 28.20	54.16 ± 25.23	-1.25 ± 9.82	0.438	73.73 ± 15.09	74.98 ± 15.96	1.25 ± 2.81	0.180	73.73 ± 15.09	74.98 ± 15.96	1.25 ± 2.81	0.180	0.030	0.074	0.102

*Results were given as mean±standard deviation

** PF: Physical functioning. RP: Role limitations due to physical problems (RP). SF: Social functioning. BP: Bodily pain. MH: General mental health. RE: Role limitations due to emotional problems. VT: Vitality. GH: General health perceptions.

† shows the results of Wilcoxon signed ranks test

‡ shows the results of Kruskal Wallis Variance Analysis of group 1 (Cefditoren Pivoxil), group 2 (Moxifloxacin) and Control group

2. Endoscopic examination: Endoscopic examination with 0° and 30° endoscopes were performed in Endoscopy Unit of ENT Department of Kirikkale University Faculty of Medicine. Discharge (none, clear and thin, thick, purulent); mucosal status (normoplasia, light hyperplasia with no erythema, hyperplasia) (18); anatomic anomalies (septal deviation, lateral rotation of the uncinate process, turbinate hypertrophy and other anatomic anomalies) (17) were examined.

3. The SF-36 Health Survey: The SF-36 Health Survey (9) is a multi-item global assessment of patient function that assesses eight health concepts including:

1. Physical functioning (10 items) (PF),
2. Role limitations due to physical problems (four items) (RP),
3. Social functioning (two items) (SF),
4. Bodily pain (two items) (BP),
5. General mental health (five items) (MH),
6. Role limitations due to emotional problems (three items) (RE),
7. Vitality (four items) (VT)
8. General health perceptions (six items) (GH).

Each scale yields a score of 0-100, with lower scores reflecting greater limitations in function. If the patient indicated to participate the study, questionnaire form given to his/or her and the same doctor gave information for filling the form. Scoring of the questionnaire was completed by hand (23). For all eight items, initial stage before treatment (In), after treatment (Ar) and gain (g) ($g = \text{Ar value} - \text{In value}$) values were found.

Method

1. All patients included in the study group (Group 1 and 2) were evaluated with history, ENT examination, endoscopic examination.
2. Using SF-36 questionnaire, eight health concepts of patients' health were evaluated in the study and control groups and Initial (In) values were obtained.
3. In the study group, group 1 patients were given Cefditoren pivoxil (Spectracef®) and group 2 patients were given Moxifloxacin (Avelox®) therapy.
4. All patients in group 1 and 2 examined again and Waters' graphy was taken.
5. By SF-36 health survey, for all eight domains, Ar values were obtained in the study (Group 1 and 2) and control groups.
6. In Cefditoren pivoxil and moxifloxacin; and control groups separately, gain (g) values for eight items (PF, RP, SF, BP, MH, RE, VT, GH) were found. Therefore, if the gain for that item was positive, the patient were improved for that item; and if the gain was negative, the patient were not improved for that

item.

All steps of the study were planned and continued with approval of Kirikkale University Faculty of Medicine Local Ethique Committee and according to the principles outlined in the Declaration of Helsinki (19).

Statistical analysis: Statistical packet for SPSS (Version 10.0) was used for statistical evaluation. In cefditoren pivoxil; and moxifloxacin; and control groups separately; the difference between Initial and After values of SF-36 Health Survey domains (PF, RP, SF, BP, MH, RE, VT, GH) were analyzed by "Wilcoxon Signed Ranks Test".

The difference between ages; and each of the SF-36 Health Survey results (PF, RP, SF, BP, MH, RE, VT, GH) at In, Ar and gain of group 1, group 2 and control group were analyzed by Kruskal-Wallis Variance Analysis. When statistically significant result was present, to detect the value of group which had caused difference, pairwise comparisons were done by "Mann Whitney U Test" with Bonferroni correction.

For cefditoren pivoxil; and moxifloxacin groups separately; effects of age, number of the attacks in last per year and presence of septal deviation (SD) on SF-36 Domains were analyzed by "Linear Regression Analysis". p value < 0.05 was considered as statistically significant.

RESULTS

SF-36 Health Survey results of the study and control groups-initial, after and gain- were shown as mean±standard deviation on Table 1. In group 1, number of ARS attacks in last year was 2.00 ± 2.16 (0.00-6.00); in group 2, it was 1.90 ± 1.19 (0.00-4.00). Septal deviation was present in 5 (50%) patients in group 1; and in 8 (80%) patients in group 2.

The difference between ages of group 1, group 2 and control groups was analyzed by "Kruskal-Wallis Variance Analysis". No statistically significant difference was found ($p=0.962$).

In cefditoren pivoxil; and moxifloxacin; and control groups separately; the difference between Initial (In) and after (Ar) values of SF-36 Health Survey domains (PF, RP, SF, BP, MH, RE, VT, GH) were analyzed by "Wilcoxon Signed Ranks Test". In cefditoren pivoxil group, at RE ($\text{In}=39.99 \pm 34.42$, $\text{Ar}=73.33 \pm 30.63$) ($p=0.041$), VT ($\text{In}=29.50 \pm 23.02$, $\text{Ar}=50.00 \pm 25.81$) ($p=0.021$) and GH ($\text{In}=45.82 \pm 22.73$, $\text{Ar}=58.74 \pm 18.05$) ($p=0.043$) domains, statistically significant difference was found (see on Table 1). In control group, no statistically significant difference was found ($p>0.05$).

The difference between each of the SF-36 Health Survey results (PF, RP, SF, BP, MH, RE, VT, GH) at initial, after and gain of group 1, group 2 and control were analyzed by Kruskal-Wallis Variance Analysis (see on Table 1). When statistically significant result was present, to de-

Table 2. The results of the pairwise comparisons by Mann Whitney U Test with Bonferroni correction

Groups	PF-In	PF-Ar	RP-In	RP-g	SF-In	BP-In	BP-Ar	BP-g	MH-In	VT-In	VT-g	GH-In
Cefditoren Pivoxil-Moxifloxacin	0.119	0.704	0.846	0.074	0.282	0.362	0.238	0.052	0.324	0.305	0.039	0.403
Cefditoren Pivoxil -Control	0.001	0.017	0.018	0.010	0.006	0.000	0.168	0.002	0.015	0.007	0.008	0.004
Moxifloxacin-Control	0.057	0.043	0.038	0.455	0.214	0.027	0.011	0.443	0.110	0.037	0.871	0.185

test the value of group which had caused difference, pairwise comparisons were done by "Mann Whitney U Test" with Bonferroni correction (see on Table 2).

In cefditoren pivoxil group, PF-In ($p=0.001$), PF-Ar ($p=0.017$), SF-In ($p=0.006$), BP-In ($p=0.00$), MH-In ($p=0.015$), VT-In ($p=0.007$), GH-In ($p=0.004$) values were significantly lower; and RP-g ($p=0.010$), BP-g ($p=0.002$), VT-g ($p=0.008$) values were significantly higher than the control group. In moxifloxacin group, BP-Ar ($p=0.011$) values were significantly lower than the control group (see on Table 2). At these domains, there was no significant difference between cefditoren pivoxil and moxifloxacin groups ($p>0.017$).

For cefditoren pivoxil; and moxifloxacin groups separately; effects of age, number of the attacks in last per year and presence of SD on gain by the treatment values of SF-36 Domains were analyzed by "Linear Regression Analysis" (Table 3).

DISCUSSION

There are several goals in the treatment of ARS (3,20) which are to return the sinuses to a normal state of health and to prevent the complications of sinusitis. To provide adequate systemic treatment of the likely bacterial pathogens (i.e., *S pneumoniae*, *H influenzae* and *M catarrhalis*) and symptomatic relief may be the most important concerns (4). The physician should be aware of the probability of bacterial resistance within their community (2).

Cultures are not routinely obtained in the evaluation of acute sinusitis but should be obtained in a patient in intensive care or with immunocompromise, in children not responding to appropriate medical management, and in patients with complications of sinusitis. Because the nose is colonized with multiple nonpathogenic species of bacteria, care must be taken when evaluating culture results². Because of this, we did not take culture from the nose in our study.

CT scanning has poor specificity for the diagnosis of acute sinusitis and is the modality of choice, however, in specific circumstances such as in the evaluation of a patient in intensive care, when complications are suspected. CT scanning can give valuable information regarding the anatomical and mechanical contributions in the development of acute sinusitis. Magnetic resonance imaging (MRI) is excellent for evaluating soft tissue disease within the sinuses, but it is of little value in the diagnostic workup for acute sinusitis (2).

In clinical trials in adults and adolescents, cefditoren pivoxil demonstrated good clinical and bacteriological efficacy in acute maxillary sinusitis, acute pharyngitis/tonsillitis (6,7); and may be preferable for the treatment of acute otitis media and acute sinusitis in children (5). Moxifloxacin, a new quinolone antibiotic (21), is used for the outpatient treatment of bacterial respiratory infections-acute ex-

Table 3. Linear Regression Analysis results about effects of age, number of the attacks for last per year and presence of septal deviation on gain values of the SF-36 Domains of the Cefditoren Pivoxil and Moxifloxacin groups

Cefditoren Pivoxil Group	SF-36 Survey Results*															
	PF-g		RP-g		SF-g		BP-g		MH-g		RE-g		VT-g		GH-g	
	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p
Age	0.433	0.423	0.674	0.141	-0.108	0.847	-0.021	0.970	-0.080	0.884	-0.083	0.864	0.414	0.445	0.407	0.424
Attacks	-0.035	0.939	0.438	0.253	-0.046	0.926	-0.178	0.714	-0.188	0.696	-0.446	0.313	-0.234	0.615	-0.313	0.479
SD	0.131	0.823	0.207	0.657	0.048	0.939	-0.010	0.987	-0.097	0.874	-0.152	0.779	0.409	0.496	0.134	0.809
Moxifloxacin Group																
Age	0.053	0.905	-0.149	0.700	0.193	0.501	0.101	0.681	0.377	0.329	-0.177	0.676	0.304	0.293	-0.746	0.033
Attacks	-0.062	0.898	0.512	0.243	-0.738	0.043	-0.863	0.014	-0.249	0.537	0.238	0.602	-0.628	0.068	0.136	0.655
SD	-0.087	0.857	-0.177	0.667	0.468	0.153	0.492	0.094	0.342	0.400	-0.419	0.367	0.521	0.112	0.118	0.695

* PF-g: Physical functioning gain, RP-g: Role limitations due to physical problems gain, SF-g: Social functioning gain, BP-g: Bodily pain gain, MH-g: General mental health gain, RE-g: Role limitations due to emotional problems gain, VT-g: Vitality gain, GH-g: General health perceptions gain.
Attacks: Number of ARS attacks for last per year
SD: Septal deviation

cerbation of chronic obstructive pulmonary disease (AE-COPD), pneumonia and acute sinusitis (10,22).

Women have more episodes of infective sinusitis than men because they tend to have more close contact with young children. The rate in women is 20.3% compared with 11.5% in men (1). In our study, women patients were more than men in both groups and this was compatible with the literature.

QOL is a recognized important health measure and quantifies health status as perceived by a patient (11,15). QOL has been studied in clinical research and applied as a measure over the last 15 years (11,16). In the present study, in patients with ARS treated by cefditoren pivoxil (Spectracef®) or moxifloxacin (Avelox®), we investigated multi-item patient functions of health concepts by SF-36 Health Survey comparing with the control group. The SF-36 used as a measure of general health status, is a useful as a tool in QOL in ARS patients (4).

In our study, in group 1 and 2, symptoms, examination findings and Waters' graphy findings were improved at the end of antibiotic therapy; and none of the patients needed additional antibiotic treatment. There was no significant difference between numbers of ARS attacks in last per year of the patients in both groups. Septal deviation was present in 50% and 80% of the patients in group 1 and 2 respectively. In cefditoren pivoxil; and moxifloxacin groups separately; the difference between In and Ar values of SF-36 Health Survey domains were analyzed. In cefditoren pivoxil group, at RE, VT and GH domains, QOL results were significantly higher at the Ar period.

The difference between each of the SF-36 Health Survey results at In, Ar; and gain of group 1, group 2 and control were analyzed. In cefditoren pivoxil group, RP-g, BP-g and VT-g values were significantly higher than the control group. In moxifloxacin group, BP-Ar value were significantly lower than the control group. At these domains, there was no significant difference between cefditoren pivoxil and moxifloxacin groups.

For cefditoren pivoxil; and moxifloxacin groups separately; effects of age, number of the attacks per year and presence of septal deviation on gain (g) values of SF-36 Domains were analyzed by "Linear Regression Analysis". It seems that, in older patients, SF-36-gain scores are impaired in both groups. In cefditoren pivoxil group, RE-g, SF-g, BP-g and MH-g subscores were lower than younger adults. In Moxifloxacin group, GH-g ($p=0.033$, Beta: -0.746), RP-g and RE-g scores were also lower than younger adults. Older patients' additional health problems and some degree of immunological deficiencies may affect the gain by the treatment and benefit from the antibiotic usage may be lower than the young adults. We must be very careful in the treatment of the older patients and follow-up visits of them should be better to be more closely.

In the patients with higher number of ARS attacks per last year, QOL and general health status perceived by the

patients may be affected too much (11). In cefditoren pivoxil group, GH-g, PF-g, RE-g, SF-g, BP-g, VT-g and MH-g subscores; and in Moxifloxacin group, PF-g, RE-g, SF-g ($p=0.043$, Beta: -0.738), BP-g ($p=0.014$, Beta: -0.863), VT-g and MH-g subscores were lower than the patients with less attacks. In patients with more ARS attacks, it seems that SF-36 gain by the treatment lower; and because of worse QOL, patients feel more disturbances (11). In these patients, duration of the treatment may be longer and also frequent control visits may be planned. And also, the patient and his/her family may be noticed that their therapy may be more difficult than the patients with less ARS attacks.

In patients with septal deviation, SF-36 gain scores seem more impaired. In cefditoren pivoxil group, RE-g, SF-g, BP-g and MH-g subscores; and in Moxifloxacin group, PF-g and RP-g, subscores were lower than the patients without septal deviation. A deviated nasal septum or a septal spur may cause compression of the middle turbinate and resultant narrowing of the middle meatus¹. Therefore, in these patients antibiotics' effectiveness may be lower; QOL may be worse and the patients feel more disturbances.

Rechtweg JS, et al. (4) investigated the efficacy of clarithromycin and amoxicillin/clavulanate (A/C) for the treatment of ARS relative to the patient's quality of life (QOL) by the Short Form 36 survey (SF-36). They concluded that Clarithromycin and A/C were equally effective in treating ARS. The clarithromycin patients felt better more rapidly (at 14 days), but both groups of patients had long-term improvement in symptoms at 28 days. In our study, treatment duration was decided according to the clinical improvement of the patients. Since patients' symptoms, purulent drainage and other clinical findings and pathologies on the Waters' graphies were improved on the first control visit-on the 10th day in Cefditoren pivoxil group and on the 7th day in Moxifloxacin group-we did not give any longer therapies in both groups.

In Moxifloxacin group, the number of patients with septal deviation was higher than the Cefditoren pivoxil group. This may help to explain the difference between two groups' gain in the SF-36 Health Survey. Even though the recommended dose of Moxifloxacin for acute sinusitis is "400 mg, once a day, for 7 days" in its prospectus; the difference between the gains of the SF-36 survey shows that drug usage time may be at least 10 days with a dose of 400 mg, once a day.

In our study, even though RP-g, BP-g and VT-g values were significantly higher in cefditoren pivoxil group than the control group; we concluded that Cefditoren pivoxil and Moxifloxacin are both effective in treating ARS. Older age, higher number of ARS attacks for last per year and presence of septal deviation may affect SF-36 survey results and impair QOL. In ARS patients with these risk factors, doctors must be very careful and closely follow-up the patients in order to detect any complications as soon as possible.

REFERENCES

1. Ramanan RV, Khan AN. Sinusitis. <http://www.emedicine.com/radio/topic638.htm> (Feb 9 2006).
2. Sobol SE, Schloss MD. Sinusitis, Acute, Medical Treatment. <http://www.emedicine.com/ent/topic337.htm> (Feb 9 2006).
3. Sinus and Allergy Health Partnership Antimicrobial treatment guidelines for acute bacterial rhinosinusitis. *Otolaryngol Head Neck Surg* 2000;123:1-32.
4. Rechtweg JS, Moinuddin R, Houser SM, Mamikoglu B, Corey JP. Quality of life in treatment of acute rhinosinusitis with clarithromycin and amoxicillin/clavulanate. *Laryngoscope* 2004;114:806-10.
5. Takenaka M, Morikawa Y, Nakagawa T, Takashima T, Haruta T, Tsuji T. Causative organisms of acute otitis media and acute sinusitis in children and their susceptibility of oral beta-lactam antibiotics. *Jpn J Antibiot* 1999;52:162-71.
6. Wellington K, Curran MP. Spotlight on cefditoren pivoxil in bacterial infections. *Treat Respir Med* 2005;4:149-52.
7. Wellington K, Curran MP. Cefditoren pivoxil: a review of its use in the treatment of bacterial infections. *Drugs* 2004;64:2597-618.
8. Miravittles M. Moxifloxacin in respiratory tract infections. *Expert Opin Pharmacother* 2005;6:283-93.
9. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992;30:473-83.
10. Kuzman I, Kincl-Brodnjak V, Ermakora S, Kovacevi, D, Kuzman T. Efficacy of moxifloxacin in the treatment of respiratory tract infections: the Croatian post-marketing study. *Lijec Vjesn* 2005;127:77-81.
11. Muluk NB, "The SF-36 Health Survey in Tinnitus Patients with High Jugular Bulb?" *Journal of Otolaryngology* (In press).
12. Lanza DC, Kennedy DW. Adult rhinosinusitis defined. *Otolaryngol Head Neck Surg* 1997;117(3 Pt 2):1-7.
13. Spectracef 200 mg film tablet. http://www.abdiibrahim.com.tr/urun_portfoyu/pdf/ub484.pdf (Feb 9 2006).
14. Johnston C. DG DISPATCH - ICAAC: Spectracef (Cefditoren Pivoxil) Effective For Sinusitis, Pharyngitis, Bronchitis Exacerbations. <http://www.pslgro-up.com/dg/1E1EBA.htm> (Feb 9 2006).
15. Avelox® (Moxifloxacin HCl) Study Reports Complete Eradication of Bacteria in Acute Bacterial Sinusitis Patients in Three Days. http://www.avelox.com/en/home/article/SinusitisSpeed_07052005.html (Feb 9 2006).
16. Avelox. http://www.pdrhealth.com/drug_info/rxdrug-profiles/drugs/ave1540.shtml (Feb 9 2006).
17. Lund VJ. Diagnosis and treatment of nasal polyps. *BMJ* 1995;311:1411-4.
18. Tos M, Larsen PL. Nasal Polyps: Origin, Etiology, Pathogenesis, and Structure. In: Kennedy DW, Bolger WE, Zinreich SJ (Eds.). *Diseases of the Sinuses, Diagnoses and Management*. Hamilton: B.C. Decker, 2001: pp 57-68.
19. 52nd WMA General Assembly. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA* 2000;284:3043-9.
20. Kaliner MA, Osguthorpe JD, Fireman P, Anon J, Georgitis J, Davis ML, Naclerio R, Kennedy D.. Sinusitis: bench to bedside. Current findings, future directions. *Otolaryngol Head Neck Surg* 1997;116(6 Pt 2):1-20.
21. McGee DH, Holt WF, Kastner PR, Rice RL.. Safety of moxifloxacin as shown in animal and in vitro studies. *Surv Ophthalmol* 2005;50 Suppl 1:46-54.
22. Van Laethem Y, Sternon J. Telithromycin, first ketolide. *Rev Med Brux* 2003;24:42-6.