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Differences in Satisfaction Ratings between Men and Woman after Implanting Multifocal Intraocular Lenses (Mfiols) in Cataract Surgery

Magda Rau MD[1], Sudi Patel PhD[2]

[1]AugenKlinic-Cham, Cham, Germany

[2]NHS National Services, Edinburgh, Scotland UK

**Corresponding Author:* *Sudi Patel PhD, AugenKlinik Cham, Janahof 2, DE- 93413 Cham, Germany.*

Abstract

Purpose: *To investigate if patient gender was linked to overall satisfaction following implantation with MFIOLs.*

Methods: *Patient satisfaction scores,1-Very satisfied, 2-Satisfied or 3-Not satisfied with overall quality of vision at distance and near, were analysed one year following implantation surgery with [i]Array(Abbot), [ii] MF4(Zeiss), [iii]Tecnis(AMO) or [iv]ReZoom (Abbot). Non-parametric tests were used to determine significance of any apparent differences in distribution of overall satisfaction scores based on gender alone.*

Results: *Of 200 patients, 40 (18f, 22m) were implanted with [i],40(18f, 22m) with [ii],40(21f,19m) with [iii] &80(28f, 52m) with[iv]. There was no inter-gender satisfaction bias after implanting [i] or [iv]. Women rated higher satisfaction after implanting [ii] or [iii] compared with men ($p<0.01$). Overall, 93% of women and 89.5% of men scored their satisfaction as 1 or 2.*

Conclusion: *Most rated satisfaction as either 1 or 2. Women reported greater satisfaction with MFIOLs compared with men especially after implantation of the MF4 orTecnis MFIOLs.*

Keywords: *Bias; cataract; gender; MFIOLs; satisfaction.*

Introduction

Cataract surgery is performed primarilyto improve vision by removing the optical defects associated with cataract. The aim of implanting a multifocalintraocular lens (MFIOL)after cataract surgeryis to achieve independence from glasses not only at distance but also at intermediate and near. Could the patient's gender influence the outcome and overall satisfaction after surgery?

In general surgery, women tend to require lower amounts of epidural analgesics and demonstrate greater levels of motor blockade compared to men[1]. Afterhand surgery, older women report less pain compared with younger menand respondmore positively to satisfaction questionnaires [2]. This suggests there may be a gender bias in relation to pain and discomfort following surgery. However, other studies[3] found that prior to surgery women presented with higher scores for muscular-skeletal pain compared with men but, one month after surgery no gender difference in the pain scores occurred.And, women were more prone to develop complications following facial defect repairs compared with males but this did not impact on overall satisfaction[4]. This suggests,there might be similar gender based differences in the overall satisfaction and clinical outcomes after cataract surgery.

In a European study, women did show a great improvement after cataract surgery compared with men[5]. A study conducted in Iran involving 478 subjects showed that women were less satisfied compared with men after cataract surgery [6]. However, a study based in rural China found no gender bias in the outcomes

following cataract surgery[7]. Several factors could account for the differences between studies such as, the patients' understanding of the word satisfaction and the investigator's interpretation of outcome measures. On a more objective basis, Behndig et al [8]found significant gender differences regarding overall biometry and the estimation of IOL power impacted on post-op refractive outcomes. But this study[8]did not consider overall satisfaction. In another study both gender and economic status played a role when deciding on the type of IOL implanted but, there was no gender based difference in overall satisfaction[9].

Women tend to present with symptoms of presbyopia earlier than men. This has been linked to different working distances and tasks [10]. Several studies reported that visual acuity measurements in women were lower when compared with data obtained from males [11-16]. Nevertheless, there is no clear evidence of women reporting less satisfaction with their vision compared with men. These findings could be associated withthe influence of sex hormones on the visual cortex [17,18]. The influence on the visual cortex could be some form of evolutionary adaptation. If this is the case then, women may have adapted to cope and become more tolerant toshifts in overall quality of vision and different types of vision correcting procedures. Women might report higher levels of satisfaction because of greater levels of tolerance, acceptance and adaptability. Multifocal IOLs, by their nature will compromise the overall quality of vision through a loss of contrast to achieve an extended range of relatively clear vision from far to near. Multifocal IOLs provide the patient with two or more optical foci. The patient needs to adapt by either ignoring, or suppressing, the undesired image by quickly paying attention to the desired image. Women may be more able to subdue and disregard the unwanted images formed by the multiple foci and rely just on the image relating to the visual task leading to higher rates of tolerance. Is there a gender difference in the acceptance of the blurred ghost images present when lookingeither close or faraway objects?Are women more tolerant to the optical side effects as glares and haloes? Are women more patient and tolerant during optical rehabilitation after the MFIOL implantation? Are women more grateful to be rid of reading glasses for aesthetic reasons or are they more interested in finer visual details?

The aim of this study was, toexamine the overall satisfaction scores recorded bypatients implanted with MFIOLs and determine if the self-perception of satisfaction was linked to patient gender.

Materials and Methods

This was aretrospective, post-hoc, longitudinal, cohort study involving a review of patient records. Inclusion criteria were bilateral cataract, no retinal and optic nerve pathology, and strong desire to achieve spectacle independence, willingness to accept potential optical side effects and longer optical adaptation period after surgery.

Exclusion criteria included patients with history of ocular disease, previous ocular surgery, astigmatism of more ≤ 1.25 D, lack of satisfaction with prescription multifocal glasses, overly high expectations for postoperative quality of vision, anxious or demanding personalities, those whose jobs demanded high visual acuity at near or people who worked at night.

All patients received phaco-emulsification and implantation of MFIOLs and all surgeries were performed by one surgeon. The data were obtained, without exception, during routine postoperative ophthalmological examination following cataract surgery.The patients presented for routine uncomplicated surgery and implanted with MFIOLs bilaterally. Each patient was bilaterally implanted with one of the following four MFIOLs

i) Array(AMO, Inc., Santa Ana, CA)a silicone flexible aspheric progressive multifocal IOL featuring five concentric zones where zones 1,3 and5 feature a distance dominant correction while zones 2 and 4 incorporate the near dominant correction.

ii) MF4 (ZeissMeditec AG, Jena, Germany) a single-piece, hydrophilic acrylic IOL featuring four concentric zones where the central zone is near dominant

iii) Tecnis(AMO, Inc., Santa Ana, CA) an acrylic aspheric prolate anterior surface with a diffractive posterior surface.

iv) ReZoom (AMO, Inc., Santa Ana, CA) an acrylic IOL with five refractive zones from centre outwards as follows:distance-dominant zone, near-dominant zone, distance zone, near-dominant zone and lastly distance-dominant zone.

Only the scores of those patients with no complications were reviewed. The patients were instructed to fill out a questionnaire anonymously one year after surgery of the second eye. The Tenets of the Helsinki Declaration were adhered to throughout.

Statistical Treatment of Data

Several designs of patient questionnaires have been validated for ophthalmological use. Results from questionnaires involving specific life style choices and tasks (driving, occupation, hobbies etc) are in themselves useful. We were interested in the patients' final, all-embracing, self-perception of satisfaction in a clear and simple manner using a force choice between three simple options. The self-certified patient satisfaction scores were: 1= very satisfied with day-to-day life and overall quality of vision at distance and near. 2= fairly satisfied with day-to-day life and overall quality of vision at distance and near. 3= Not satisfied with day-to-day life and overall quality of vision at distance and near. Data were recorded on standard spreadsheets and suitably anonymized. The data were analysed using appropriate non-parametric statistical tests (1 and 2way ANOVA, Kruskal-Wallis and Friedman tests where applicable) and calculation of odds ratios to provide answers to the following:

i) Was the overall satisfaction score biased towards gender in each of the 4 groups of patients?

ii) Was there a gender bias based on the overall satisfaction scores irrespective of MFIOL type and design?

iii) Did the gender of a patient bias the overall satisfaction score towards any specific MFIOLdesign?

iv) Was the overall satisfaction biased towards a specific MIOL?

The significance level was set at p value<0.05 for rejection of the null hypothesis.

Results

All surgeries were performed between the years 1999 – 2012. A total of 200 patients fulfilled our criterion. Of these patients40 (18 female, 22 male) were implanted with Array (AMO),40 (18 female, 22 male) were implanted with MF4 (Zeiss), 40 (21 female, 19 male) were implanted with Tecnis (AMO), 80 (28 female, 52 male) were implanted with ReZoom (AMO).

The main data and results are shown in table 1 and figures 1-4.

Table 1: Satisfaction scores for each multi-focal intraocular lens (MFIOL). The % values are shown in parentheses. 1 = very satisfied 2 = satisfied and 3 = not satisfied. The significance scores (p) resulting from non-parametric ANOVA tests evaluation are shown. An * identifies the comparison where a significant difference in satisfaction scores was encountered based on gender. F=female and M=male. The ** identifiesa leaning towards a difference in satisfaction that was deemed insignificant after the Bonferroni correction.

Table 1. *Satisfaction scores for each multifocal intraocular lens.*

MFIOL	Gender	Satisfaction Score			p
		1	2	3	
Array	F	8(44.4)	9(50)	1(5.6)	0.849
	M	10(55.6)	9(40.9)	3(13.4)	
MF4	F	10(55.6)	8(44.4)	0(0)	0.001*
	M	2(9.1)	18(81.8)	2(9.1)	
Tecnis	F	15(71.4)	6(28.6)	0(0)	0.005*
	M	6(31.6)	8(42.1)	5(26.3)	
ReZoom	F	12 (42.9)	11(39.2)	5(17.9)	0.382
	M	24(46.2)	26(50)	2(3.8)	
Overall satisfaction	F	45(53.0)	34(40.0)	6(7.0)	0.027**
	M	42 (36.5)	61(53.0)	12(10.5)	

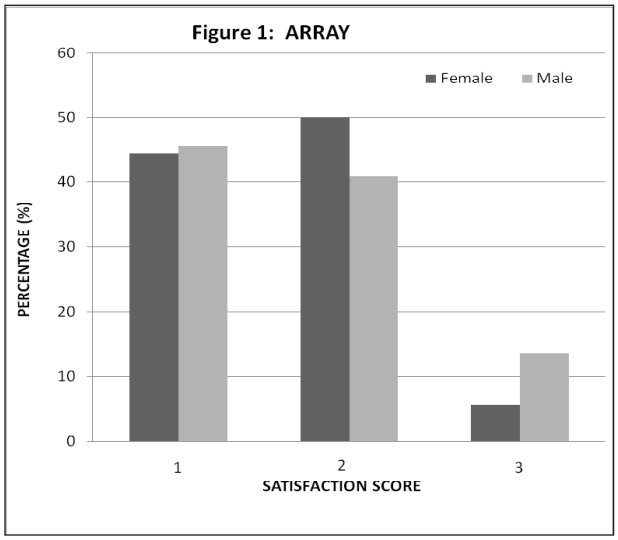

Figure 1. *Overall satisfaction scores rated by patients implanted with Array multifocal IOL.*

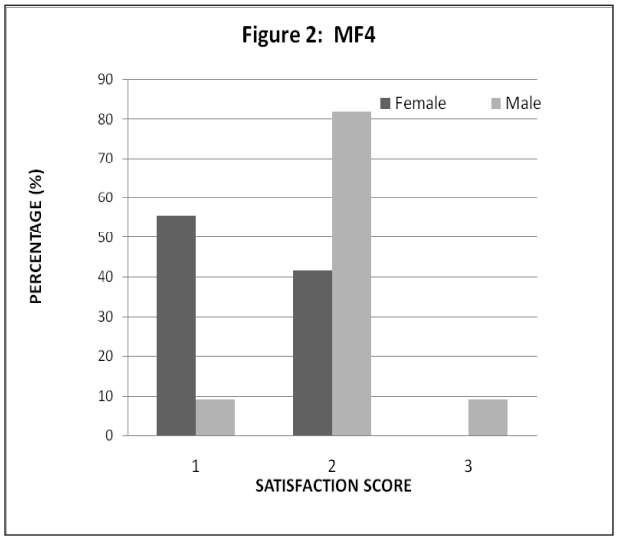

Figure 2. *Overall satisfaction scores rated by patients implanted with MF4 multifocal IOL*

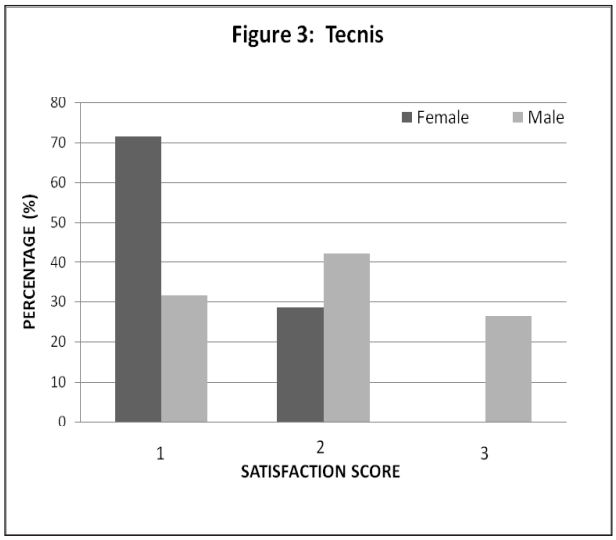

Figure 3. *Overall satisfaction scores rated by patients implanted with Tecnis multifocal IOL*

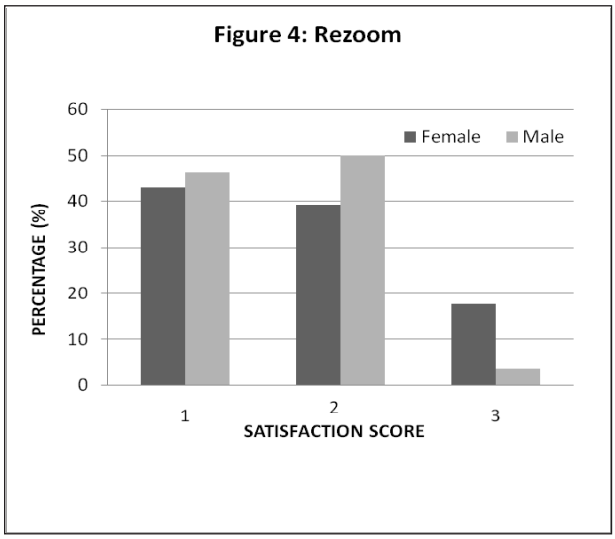

Figure 4. *Overall satisfaction scores rated by patients implanted with ReZoom multifocal IOL*

Reporting the key findings, there was no difference between females and males in overall satisfaction score in those patients implanted with either Array or ReZoom ($p>0.01$). There was a significant difference between females and males in overall satisfaction score in those patients implanted with MF4 or Tecnis ($p<0.01$). For these two MFIOLs, a greater proportion of women rated their scoreas 1 (very satisfied)compared with men. Selected odds ratios (ORs)[19] revealed thatfor the MF4, men rated their overall satisfaction as either 2 or 3 as opposed to 1 ($p=0.004$) whereas women tended to rate their overall satisfaction as either 1or 2 rather than 3 ($p=0.014$). The OR results for the Tecnis MFIOLrevealed that women rated their satisfaction as either 1 or 2 but not 3 ($p=0.010$), menalso tended to rate their score as 1 or 2 as opposed to 3 but this OR was not significant ($p=0.127$).

There was no overall gender bias towards a specific MFIOL ($p=0.320$) and no single MFIOL led to greater levels of satisfaction compared withthe other three ($p=0.453$). Ninety three percent of women rated their overall satisfaction as either 'very satisfied' or 'satisfied' compared with 89.5% of men. The difference was not significant after applying the Bonferroni correction for multiple comparisons ($p=0.027$).

Discussion

The majority patients were either very satisfied or satisfied with the overall outcome after MFIOL implantation. This was not a surprise result because all the patients self-elected to have surgery after being thoroughly informed of all the risks, benefits, positive and negative issues followinga full ophthalmological work up general health check. Figures 1-4 and table 1 show a gender bias whereby women were more likely to report higher satisfaction than men. Could this be a placebo effect? Clinical interventions are aimed at improvinga situationnot, to make matters worse. There issome bias from the outset. Were patients responding to a situation analogous to a placebo because by informing them that their vision would improve and raising up their expectations? Compared with men, women are more likely to develop symptoms of illness when told that an intervention, such as a totally inert pill, will do harm. Both genders are susceptible to psychogenic illness but women are more susceptible than men[20-22]. If women are more susceptible to a nocebo effect then, could they be more susceptible to the opposite? Why should women be more susceptible to either a nocebo or placebo? Paul Enck said *'Women tend to operate more on past experiences whereas men seem more reluctant to take history into a situation'*[23]. Therefore, compared with men, women may be more likely to recall their passed experience of failing vision and dependence on glasses (or contact lenses) before completing their score and, bemore likely to accept the shortcomings and the compromised levels of acuityprovided by MFIOLs.

At the beginning of this paper we noted several studies reporting that visual acuity measurements in women were lower when compared with data obtained from men[11-16]. Could this mean that women are predisposed or adapted to accept lower visual performance in the distance compared with men? Perhaps more tolerant of the visual compromise or, is there a stronger aesthetic urge to be free of glasses in women implanted with MFIOLs? On the other hand, could there be a physiological basis operating in tandem with a psychogenic effect?

The clinical assessment of acuity requires the patient to keep the eyes open and read off a chart. After a blink during acuity testing, the optical quality of the retinal image gradually improves peaking after about 6-8 seconds and then gradually deteriorates while the eyes are kept open [24]asthe precorneal tear film becomes irregular before total breakdown of the film. Ageing leads to a fall in the flow of tears, reduced tear stability, increased tear osmolality and increased rate of tear evaporation [25] and these affects are more prominent in women [26]. Women are more likely to develop clinical features of dry eye butmany remain asymptomatic.When a person blinks, the retinal image is momentarily cancelled outand there is no stimulus reaching the visual cortex. The individual is consciously unaware of this cancelation when s/he is effectively blind for about 200 millisecs during the blink [27]. The average blink rate is 15 times/min reducing to 4 times/min during concentrated tasks such as reading or staring at visual acuity charts. We are blind for 3 seconds every minute during normal activity. The visual system, by way of lateral inhibition, prevents us from noticing this momentary blindness. This neural adaptation prevents us noticing these episodes of temporary blindness. The inter-blink interval is about 15 seconds during concentrated tasks such as reading or staring at a test chart. This is sufficient time for the retinal image to degrade after opening the eyes. Women may have adapted to this constantly changing and,on average,degraded retinal image leading to the reports of lowered visual acuity compared with men.

Perhaps women have the tendency to adapt as a mechanism of accepting the less than perfect retinal image resulting in greater tolerance to the performance of MFIOLs.

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