ABSTRACT

OBJECTIVE: To determine the frequency of Cystoid Macular Edema (CME), after Phacoemulsification diagnosed on Optical Coherence Tomography.

STUDY DESIGN: A descriptive cross sectional study

PLACE AND DURATION: Department of Ophthalmology, Lady Reading Hospital, Peshawar, Pakistan, from 1st April 2011 to 30th April 2012.

METHODOLOGY: A sample of 100 patients undergoing phacoemulsification surgery was selected using purposive non-probability sampling technique. Descriptive statistics were applied as number (frequency) and percentage like Central point thickness and age.

RESULTS: This study was conducted on 100 cases of Phacoemulsification surgery. Minimum age was 40 year and maximum was 80 year with mean age of 55.73±8.37 years. Minimum Central Point Thickness (CPT) was 121nm and maximum was 503nm with mean CPT of 172.31±81.158nm. Cystoid Macular Edema (CME) was diagnosed in 9 (9%) cases. 3(3%) females and 6(6%) males were diagnosed as CME cases. Majority of the patients have visual acuity of 6/12(44.44%).

CONCLUSION: It concludes that Frequency of CME (diagnosed on OCT) is not very common in post phacoemulsification surgery patients but needs to be treated as it can lead to loss of vision.

KEY WORDS: Extra capsular Cataract Extraction (ECCE), Phacoemulsification (Phaco), Central point thickness (CPT), Cystoid formations, Cystoid Macular Edema (CME)

INTRODUCTION

Cystoid macular edema (CME) following cataract surgery, also known as pseudo-phakic CME or Irvine-Gass syndrome, is a common cause of visual loss after cataract surgery. It is a painless condition in which multiple cystic areas of fluid appear in the outer plexiform and inner nuclear layer of the macula resulting in its thickening. This causes blurred or distorted central vision. It has a peak incidence at four to six weeks following surgery. In most, this vision loss is temporary and responds to treatment with topical anti-inflammatory medications like corticosteroids and non-steroidal anti-inflammatory drugs. However, some cases fail to respond and develop permanent visual loss.

Much variation exists in the reported incidence of CME following cataract surgery. It has been reported to be as high as 41%. Others give an incidence of 25.5%, 20%, 19% and 9.87%. Belair reported that the OCT evidence of CME after phacoemulsification is 4%. In this study, Optical Coherence Tomography (OCT) was used to establish the diagnosis of CME, because its high-resolution cross-sectional imaging can quantify the development of macular thickening and is proved to be as effective as FFA in detecting CME.

There is a scarcity of local data on ‘incidence of CME following cataract surgery’ and no comparative data on CME incidence following different cataract surgeries, worldwide. Its importance can not be overlooked because of the grave visual prognosis in some patients. The aim of this study was to determine the frequency of CME after phacoemulsification since CME remains a problem following this type of cataract surgery.

METHODOLOGY

This descriptive cross sectional study conducted at Department of Ophthalmology Lady Reading Hospital, Peshawar from 1st April 2011 to 31st March 2012. During this period, 100 patients were selected for Phacoemulsification surgery by non-probability consecutive sampling. A form was designed and completed prospectively for each patient detailing demographics, history, and a complete ocular (including Snellen visual acuity) and systemic examination. Patients fulfilling the inclusion criteria were included in the study from OPD. The procedure and its benefits and risks and the proposed study protocol were discussed with each patient. An informed consent was taken. All patients were operated by a senior consultant. Postoperative visual acuity was recorded on Day 1, 4 weeks and 6 weeks with a Snellen chart. The diagnosis of CME was established on Optical Coherence Tomography.

All patients between 40-80 years with uncomplicated age related cataracts were included in the study. Diabetic or hypertensive patients were excluded in the study as they act as confounder and introduce bias in the result. Descriptive statistics were applied as number (frequency) and percentage.
The data was analyzed with SPSS 10.0.

RESULTS

This study was conducted on 100 cases of age related cataract

TABLE-I: DESCRIPTIVE STATISTICS (n=100)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Age</th>
<th>CPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>55.7300</td>
<td>172.3100</td>
</tr>
<tr>
<td>Minimum</td>
<td>40.00</td>
<td>121.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>80.00</td>
<td>503.00</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>8.37246</td>
<td>81.15787</td>
</tr>
</tbody>
</table>

CPT=CENTRAL POINT THICKNESS

TABLE - II: GENDER (FREQUENCY AND PERCENTAGE) (n=100)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>62</td>
<td>62%</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>38%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

TABLE - III: CME (FREQUENCY AND PERCENTAGES) (n=100)

<table>
<thead>
<tr>
<th>CME</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>9.0</td>
</tr>
<tr>
<td>No</td>
<td>91</td>
<td>91.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE - V: PRESENTING VISUAL ACUITY ON SNELLENS CHART OF PATIENTS WITH CYSTOID MACULAR EDEMA (n=09)

<table>
<thead>
<tr>
<th>Presenting vision on Snellens Visual acuity chart</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/9</td>
<td>01</td>
<td>11.11</td>
</tr>
<tr>
<td>6/12</td>
<td>04</td>
<td>44.45</td>
</tr>
<tr>
<td>6/24</td>
<td>03</td>
<td>33.33</td>
</tr>
<tr>
<td>6/36</td>
<td>01</td>
<td>11.11</td>
</tr>
<tr>
<td>Total</td>
<td>09</td>
<td>100</td>
</tr>
</tbody>
</table>

CME=CYSTOID MACULAR EDEMA

(Table-II). Minimum Central Point Thickness (CPT) was 121nm and maximum was 503nm with mean CPT of 172.31±181.158nm with a standard deviation of 81.15787 (Table-I). Cystoid Macular Edema (CME) was diagnosed in 9 (9%) cases (Table-III) of which 6 (66.7%) were male and 3 (33.33%) were female (Table-IV). The presenting visual acuity on Snellens chart of patients with Cystoid macular edema ranged from 6/9 to 6/36. In 1 (11.11%) patient it was 6/9, in 4 (44.45%) patients, vision was 6/12, in 3 (33.33 %) patients the vision was 6/24 and in only 01 (11.11%) case, the vision was 6/36. (Table - V)

DISCUSSION

This study was conducted to see the frequency of CME following phacoemulsification surgery. Despite various developments in procedures of Cataract surgery, CME is still a common cause of visual dysfunction after cataract surgery. Cystoid macular edema is the result of a breakdown in the blood–aqueous barrier due to different inflammatory mediators. Undergoing uncomplicated phacoemulsification surgery by a senior surgeon. Minimum age was 40 and maximum was 80 years with mean age of 55.73±8.37 years and a standard deviation of 8.37246 (Table-I). Male were in more dominance than female. There were 62 (62%) male and 38 (38%) female

inflammatory Mediators like prostaglandins leads to leakage of perifoveal capillaries, resulting in pooling of fluid in the outer retinal layers. Using optical coherence tomography (OCT), which provides a cross sectional view of the macula in a histological level of resolution, is the best tool to diagnose CME. Although Phacoemulsification seems to carry better visual prognosis than ECCE, CME remains a problem following this type of cataract surgery. A study by Ferrari et al examined the association between CME and amount of energy delivered during phacoemulsification. They found that in patients who received more than one joule of energy, FFA revealed higher incidence of breakdown of blood-retinal barrier. As disturbance of retinal-blood barrier by inflammatory mediators leads to CME, thus, greater trauma would result in a greater inflammatory response and a greater risk of CME. It is known that iris is a metabolically active tissue that releases inflammatory mediators when traumatized, thus cataract surgeries with iris trauma have higher incidence of CME. There are varieties of factors which can cause increase chances of CMO after cataract surgery such as diabetes, posterior capsule rupture, vitreous loss, iris incarceration, use of iris-fixed intraocular lenses, active uveitis, epiretinal or vitreoretinal interface membrane, ocular vascular or cardiovascular disease, and retinitis pigmentosa. Other reports have linked the use of prostaglandin analogs (latanoprost), timolol maleate, and benzalkonium chloride to the increased rates of postoperative CME. Some patient factors like age and sex, may also contribute to the formation of CME. Stern et al concluded that younger age group is more prone to CME following cataract surgery. In our study 08 (88.9%) out of 9 cases were 50 and above. Thus, in our study older age group developed CME more frequently than younger age group.
In our study, out of 9 (9%) CME cases, 6 (66.7%) were male and 3 (33.3%) were female. This preponderance of male patients is a coincidental finding as the study cohort was predominated by male. The study reaffirms the lack of sexual predilection as stated in previous literature.

We excluded all those ocular and systemic diseases which are associated with CME. According to one study, Diabetes mellitus with or without diabetic retinopathy or maculopathy has got significantly higher incidence of pseudophakic CME than non diabetics. Uveitis has also been reported as the predisposing factor for pseudophakic CME. Patients who had post capsular rent with or without vitreous loss per-operatively or post-operative endophthalmitis were also excluded because these complications have been reported to increase the incidence of pseudophakic CME. Thus we excluded all those ocular and systemic conditions which are considered to affect the incidence of pseudophakic CME.

In our study, all the surgeries were performed by a single surgeon who ensured no bias resulted with regard to surgical technique and operative time. The incidence of study showed a 9.0% incidence of pseudophakic CME following uncomplicated phacoemulsification which is similar to Manju and Subramanian. The study used a superior limbal approach (2.75mm) whereas; Gulkilik using a clear temporal approach reported a 25.5% incidence of CME. Longer operative time is associated with increased postoperative inflammation.

Finally we evaluated the vision in patients diagnosed as having CME. Cystoid macular edema (CME) is a primary cause of reduced vision following cataract surgery. Most of our patient's reduced vision was in range from 6/12 to 6/24 on Snellen visual acuity chart (44.44% and 33.33% respectively). According to Harbour et al the best-corrected Snellen visual acuity after CME ranges from 20/50 to 3/200.

**CONCLUSION**

Recognition of CME is very important as this condition is sight threatening. OCT is an important tool to properly diagnose and document CME well on time. Timely and appropriate vision care can delay the onset of ocular morbidity, visual impairment and blindness.

**REFERENCES**

1550-58.