INTRODUCTION

In the recent past, diagnosis & treatment planning in orthodontics has been shifted towards facial planning. Macro-esthetics, mini-esthetics & micro-esthetics have been emphasized and orthodontic ethics has been linked to improving the nose-lip-chin balance. Lip balance in three planes has been one of the major determinants in treatment planning: Lip Incompetence, Lip Prominence, Lip Fullness, Lip Strain, Short Philtrum height, Acute Nasio-labial angle & Acute Labio-mental angles shift treatment option towards extraction in Borderline cases (arch length discrepancy=5-9 mm).

In cephalometric and photographic analysis, several reference lines have been introduced to assess anteroposterior position of the upper and lower lips: E-Line and S-Line being the most commonly used reference lines. The aim of this study was to find out the anteroposterior position of lips on photograph using E-line and S-line in patients with orthognathic profile and to establish correlation between lip prominence judged by E-Line and S-Line. The study was conducted on 90 subjects, with orthognathic profile as judged in consensus by orthodontist, prosthodontist, Oral Surgeon, Oral Pathologist and General Dentist and confirmed by lateral cephalogram (ANB 0-4°, Wits Value 0,-1mm) with age range of 12-30 years. E-Line & S-Line were drawn on photograph to assess the prominence of upper lip and lower lip. SPSS 16.0 was used for statistical evaluation. Antero-posterior position of upper and lower lip with reference to E-line was -1.9±3.33 mm -0.4±3.24 mm respectively and Antero-posterior position of upper and lower lip with reference to S-line was 3.72±2.85 mm and 1.18±3.23 mm respectively. Moreover, statistically significant correlation was found r=0.509 between Upper lip to E-Line and Upper Lip to S-Line and r= 0.861 between Lower lip to E-Line and Lower lip to S-Line.

Keys: Lip Prominence, E-Line, S-Line
ence to this line is assessed. Upper lip to E-Line =-1mm and Lower lip to E-line = 0 mm. This means that upper lip is slightly behind E-line & lower lip touches E-line in balanced face.

S-Line is drawn from midpoint between subnasale (Sn) and Pronasale (Pn) to soft tissue pogonion (Pog) and lip prominence with reference to this line is assessed. S-Line though has been used cephalometrically but it has not been used on photograph to assess lip prominence. Its cephalometric norms are as follows: Upper lip to S Line (0±2mm), Lower lip to S Line (0±2mm). Steiner used S-Line with the idea that E-Line is affected by nose length.

Aim of this study was to find out the antero-posterior position of lips on photograph using E-line and S-line in patients with orthognathic profile and to establish correlation between lip prominence judged by E-Line and S-Line.

**METHODOLOGY**

The study was conducted on 90 subjects (45 females, 45 males) with age range of 12-30 years, who reported at Faculty of Dentistry, The University of Lahore. Subjects having orthognathic profile as judged in consensus by orthodontist, prosthodontist, Oral Surgeon, Oral Pathologist and General Dentist were selected and lateral cephalogrm was taken. Those patients having ANB 0-4° and Wits Value 0,-1mm were included in the study. Patients having supernumerary or congenitally missing teeth, already undergoing with orthodontic treatment and Syndromes, were excluded from the study. Sample was collected using the non-probability convenience sampling technique.

Profile Photograph was taken for each selected subject and landmarks were listed as shown in Figure 1.E-Line & S-Line were drawn as shown in figure 2, linear distances from upper & Lower Lip to E-Line and S-Line are determined to assess the prominence of upper Lip and lower lip.

SPSS 16.0 was used for statistical evaluation. Mean, Standard Deviation, Variance, Minimum & Maximum value and Range were calculated for each variable for each subject. Correlation coefficients(r) between lip protrusion as assessed by E-Line & S-Line was determined.

**RESULTS**

The study was conducted on 90 subjects (45 females & 45 males) with mean age 18.5±3.89. Descriptive Statistics were calculated for each variable for each subject. Mean value for upper lip and lower lip antero-posterior position in patients as judged with E-Line & S-Line with orthognathic profile was determined as shown in table I.

Statistically significant co-relation was found between upper lip and lower lip prominence as assessed by E-Line & S-Line (table 2 and figure 3)

**TABLE 1: ASSESSMENT OF ANTERIOR-POSTERIOR LIPS POSITION BY E-LINE AND S-LINE**

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Lip to E-Line</td>
<td>13.00</td>
<td>-7.00</td>
<td>6.00</td>
<td>-1.90</td>
<td>3.33</td>
</tr>
<tr>
<td>Lower Lip to E-Line</td>
<td>15.00</td>
<td>-8.00</td>
<td>7.00</td>
<td>-4.00</td>
<td>3.24</td>
</tr>
<tr>
<td>Upper Lip to S-Line</td>
<td>15.00</td>
<td>-7.00</td>
<td>8.00</td>
<td>.37.22</td>
<td>2.85</td>
</tr>
<tr>
<td>Lower Lip to S-Line</td>
<td>18.00</td>
<td>-9.00</td>
<td>9.00</td>
<td>1.18</td>
<td>3.23</td>
</tr>
</tbody>
</table>

**TABLE 2: CO-RELATION BETWEEN E-LINE AND S-LINE LIP ASSESSMENTS**

<table>
<thead>
<tr>
<th></th>
<th>Lower Lip to E-Line</th>
<th>Upper Lip to S-Line</th>
<th>Lower Lip to S-Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Lip to E-Line</td>
<td>.714**</td>
<td>.509**</td>
<td>.538**</td>
</tr>
<tr>
<td>Lower Lip to E-Line</td>
<td>.645**</td>
<td>.861**</td>
<td></td>
</tr>
<tr>
<td>Upper Lip to S-Line</td>
<td></td>
<td></td>
<td>.743**</td>
</tr>
</tbody>
</table>
Assessment of Anterior-posterior position of Lips: E-Line-S-Line

Fig 1: Profile Photograph showing Soft Tissue Landmarks used in this study: Pn (Pronasale), Sn (Subnasale), Ls (Labius Superiorus), Li (Labius Inferiorus), Pog (Soft Tissue Pogonion)

Fig 2: E-Line (Pn-Pog), Upper Lip to E-Line (Ls-E-Line), Lower Lip to E-Line (Li-E-Line), S-Line (Sn-Pog), Upper Lip to S-Line (Ls-S-Line), Lower Lip to S-Line (Li-S-Line),

Fig 3: Co-relation between E-Line & S-Line Lip Assessments
DISCUSSION

Shift of paradigm from Angle to soft tissue and concepts of soft tissue planning in orthodontics have stressed on significance of nose-lip and chin evaluation with emphasis on assessment of lip prominence. Different reference lines have been used cephalometrically and photographically to assess antero-posterior position of lips: E-Line and S-Line being the most commonly used reference lines.

Photographically upper lip to E-Line is -1 mm and lower lip to E-Line is 0 mm. E-Line to upper lip is -3±2 mm and lower lip to E-Line is -2±0 mm as suggested by Ricketts in his cephalometric analysis. S-Line to upper lip is (0±2 mm) and, S Line to lower lip is (0±2 mm). Erbay EF et al in their study on ninety-six adults (55 females, mean age, 21.63 years; 41 males, mean age, 22.45 years) with Angle Class I occlusal relationships investigated cephalometrically the horizontal lip position of Anatolian Turkish adults and concluded that the upper and lower lips were retrusive according to the norms of Steiner and Ricketts. Naidu D. L in an other study assessed photographs & cephalograms of one hundred 17-25 years old mixed Indian student population with attractive facial profiles, as judged by the investigators and concluded that B line was found to be the best in terms of consistency and sensitivity followed by the E line & S-Line in terms of consistency but not sensitivity. Lip prominence however was dependent on nasal and chin position. In this study E-Line to upper lip was -1.9±3.33 mm and S-Line to lower lip was -0.4±3.24 mm while upper lip to S-Line was 3.72±2.85 mm and lower lip to S-Line was 1.18±3.23 mm, results were comparable to norms. Co-relation between E-Line and S-Line in assessing upper and lower lip was established in this study and statistically significant correlation was found.

CONCLUSIONS

Antero-posterior position of upper and lower lip with reference to E-line was -1.9±3.33 mm -0.43.24 mm respectively and Antero-posterior position of upper and lower lip with reference to S-line was 3.72±2.85 mm and 1.18±3.23 mm respectively. Moreover statistically significant correlation was found r=0.509 between Upper lip to E-Line and Upper lip to S-Line and r= 0.861 between Lower lip to E-Line and Lower lip to S-Line.

REFERENCES