Facial Nerve Palsy: A Report on the Prevalence, Intervention and Outcome in a Tertiary Hospital in the South-South Region of Nigeria

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Author’s contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Background: The facial nerve is an important and complex nerve whose course predisposes to various affectations. Most work has been focused mainly on Bell's palsy and not much has been done on other aspects of the nerve affectation.

Aim: To determine the prevalence of facial nerve palsy, possible aetiology and the treatment outcome in our environment.

Patients and Methods: This is a retrospective study of all patients diagnosed with facial nerve palsy seen in the ENT Surgery department and the Physiotherapy department of Teaching hospital university of Port Harcourt within the period of January 2015 to January 2018. The patients’ case files, clinic and ward registers were the source of data. The patients’ demographics, presenting complaints, side affected, type of lesion, aetiology, intervention and outcome, were sought from these records. Data was analyzed with IBM SPSS version 20 and results presented in statistical tables.

Results: There were altogether 76 patients seen within the period under study. There were more females than males 57.9% and 42.1% with a ratio of 1.4:1. Age ranged from 20-83 years with a mean age of 48.9+/- 14.1 years. Highest incidence was among the age range 50-59 years.

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Commonest presenting complaint was facial weakness-80.3% outright facial deviation was seen in 17.1%. The left side was more affected and upper motor neuron lesion was the commonest type of facial nerve palsy encountered 80.3%. Hypertension was the commonest aetiology. About 69.7% had a good response to management. The outcome of treatment in relation to the type was statistically significant.

**Conclusion:** Facial nerve paralysis is not rare in this region and hypertension is a common aetiology with UMNL as the commonest type. Majority recover after the paralysis with steroid treatment.

**Keywords:** Facial nerve; paralysis; treatment; bell’s palsy.

1. **INTRODUCTION**

The facial nerve is a complex cranial nerve that by virtue of its function and supply affects several aspects and functions in the head and neck region. The nerve exits from the internal acoustic meatus, passes through the parotid gland to supply motor fibers to muscles of facial expression hence affections of the parotid gland can also affect it [1]. Its fibers join the lingual nerve to form chorda tympani that innervates the anterior 2/3rd of the tongue therefore its paralysis can affect taste. It also gives supply to the lacrimal gland so dryness of the eyes can be seen in facial nerve paralysis. Therefore with paralysis of the facial nerve, there is loss of not just facial expressions such as loss of the ability to smile, frown, blink but other functions like mastication and speech can also be affected [1,2]. Hence facial nerve paralysis in view of all these can result in emotional stress and in those with long sequale, can affect self-esteem [2] as well as quality of life [3].

Facial nerve palsy is therefore a condition with several implications that can give rise to serious clinical problems. The aetiology of this condition are several ; in children delivery trauma can give rise to facial nerve palsy(FNP) in which case it is referred to as congenital FNP [4]. It is often unilateral but can be bilateral, in about 40-75% cases of unilateral palsy, the cause is not known-idiopathic [5]. There are infective causes such as herpes zoster oticus, rubella, varicella, acute otitis media, chronic otitis media, HIV, meningitis among others, in addition, tumors, trauma such as fracture base of skull can also be a cause [6]. Iatrogenic paralysis can result after parotid, middle ear and mastoid surgeries [7]. It is also known that severe systemic hypertension can be a cause of facial nerve palsy [8]. When the cause of FNP is detectable or known, it can be referred to as secondary FNP while it is idiopathic or Bell’s palsy, when there is no obvious cause [9].

FNP is seen mostly in the age range of 20-50 years. It is said to have equal sex distribution, [10] It has an incidence of about 30 cases per 100,000 population annually [11] The incidence in children is lower with 6.6 cases per 100,000 population annually [12]. It is uncommon in children under age 2 years and both left and right sides of face have equal frequency of affection [13]. In the adult, bell’s palsy is the most frequent cause of FNP-54.9% It is a diagnosis of exclusion and it is purported to be caused by reactivation of some latent viruses(herpes simplex and zoster) from cranial nerve ganglia [14]. This reactivation causes inflammation of the facial nerve [15,16] resulting in an initial neurapraxia of the nerve which is initially reversible but may finally lead to Wallerian degeneration [14]. Incidence of bell’s palsy is 20-25 cases per 100,000 population annually [14,17]. Recovery rates for bell’s palsy in adult is 91.4% while in children it is 93.1% in contrast to the 90.9% for infection. While that of cerebral infarction is 63.6% [18].

Hypertension has been found to be a cause of FNP in some studies; Trompeter et al found 4% of their cases caused by hypertension [19]. The facial nerve palsy caused by hypertension maybe independent of blood pressure control [20].

Overall outcome of FNP appears more favorable in children as compared to adults [21]. Most young patients with FNP have complete recovery within 6 months [22]. It is known that as the age increases, so does vascular degeneration resulting in decrease in peripheral blood supply. Therefore, the younger the age, the better the prognosis of full recovery [23]. The degree or severity of the paralysis at onset affects prognosis also, a severe paralysis will hardly have a full recovery of nerve function [24] The recovery rate ultimately will depend on the cause of the FNP.
2. PATIENTS AND METHODS

2.1 Study Design

This was a retrospective review of clinical records of all patients with facial nerve palsy seen in the ENT and Physiotherapy departments of the University of Port Harcourt Teaching Hospital (UPTH) from January 2015 to January 2018. The patients’ case files, clinic and ward registers were the source of data. Data on patient demographics, presenting complaints, side affected, type of lesion, aetiology, intervention and outcome were sought from these records. Data collected were then entered into Microsoft Excel and then exported to the IBM Statistical Package for Social Sciences (SPSS) version 20 for statistical analysis. Those diagnosed with facial nerve palsy but has incomplete records were excluded from the study.

2.2 Study Setting

University of Port Harcourt Teaching Hospital. Most of these patients including those from other departments are ultimately referred to Physiotherapy department for management hence the inclusion of this department in the study.

2.3 Statistical Analysis

Descriptive statistics employed means measures of mean ± standard deviation, median and ranges for quantitative variables such as age of patient; frequencies and percentages were used for qualitative variables such as sex and type of lesion. Treatment outcome was separated into good and poor. Good outcome is taken to be resolved/resolving lesions while poor outcome is unresolved/inconclusive/absconded or loss to follow up. The differences in means were compared using independent t-test while differences in proportions were compared using Pearson’s Chi Square or a Fisher’s exact test when the expected cell value was below five in at least twenty percent of the crosstab cells. A P-value of less than 0.05 was considered statistically significant.

3. RESULTS

The study involved 76 patients, 44(57.9%) females and 32(42.1%) males. There were a total number of 8,000 patients seen in these departments within the period under study giving a prevalence of 0.95%. The male to female ratio was 1:1.4. The age ranged from 20-83 with a mean age of 48.9±14.1. Age range 50-59 was the most affected 36.8% while least was 80-89 with 2.6% Fig 1. Mean age for males was 46.3 years while that for females was 52.5 years, (Table 1).

Commonest presenting complaints was facial weakness (80.3%) and weakness of one side of the body (27.6%) while outright facial deviation was seen in n=13(17.1%) of the cases (Table 2).
Table 1. Comparison of mean ages between male and female patients

<table>
<thead>
<tr>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
<th>t</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age ± SD (years)</td>
<td>46.3 ±12.3</td>
<td>52.5 ± 15.8</td>
<td>1.903</td>
<td>0.061</td>
</tr>
</tbody>
</table>

SD-standard deviation

Table 2. Presenting complaints of patients

<table>
<thead>
<tr>
<th>Presenting complaints*</th>
<th>Frequency (N=76)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial weakness</td>
<td>61</td>
<td>80.3</td>
</tr>
<tr>
<td>Weakness/inability to use one side of body</td>
<td>21</td>
<td>27.6</td>
</tr>
<tr>
<td>Facial deviation</td>
<td>13</td>
<td>17.1</td>
</tr>
<tr>
<td>Ear pain</td>
<td>7</td>
<td>9.2</td>
</tr>
<tr>
<td>Ear discharge</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>Hearing impairment</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>Difficulty in opening mouth</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Nasal bleeding</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Multiple responses apply

Left side was more affected in this study n=44(57.9%) while right side was seen in (40.8%) as shown in Fig. 2.

Majority of the cases had upper motor neuron lesion (UMNL) n=61 (80.3%) while lower motor neuron (LMNL) accounted for n=15 (19.7%).

Hypertension with CVD was the most implicated aetiology n=43(56.6%) followed by Bell’s palsy with 11.8%, Fig. 3. Some of the patients had more than one pathology coexisting, the diabetic patients’ n=9 also had hypertension coexisting while the patient with Herpes zoster oticus in addition, had RVD.

Most of these patients were managed medically (80.3%) while 27.6% had physiotherapy. (Table 3). About 69.7% did well and had good outcome while 30.3% had poor recovery and some of these n=8, were lost to follow up while 13 patients had unresolved lesion.

Table 3. Intervention received by the patients

<table>
<thead>
<tr>
<th>Interventions*</th>
<th>Frequency (N=76)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical (medications)</td>
<td>61</td>
<td>80.3</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>21</td>
<td>27.6</td>
</tr>
<tr>
<td>Surgical**</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Multiple responses apply
**Maxillectomy – patient with sinonasal cancer

The patients in the age group 50-59 made up the majority of the good outcome however age and sex showed no statistically significant relationship with outcome; but the type of lesion showed that patients with LMN had a significantly (P=0.026) higher proportion of good outcome in comparison to UMNL (93.3% versus 63.9%) (Table 4).

When outcome was compared with aetiological factors, the differences in the proportions of the aetiological factors by treatment outcome was found to be statistically significant (P=0.0001) (Table 5).

4. DISCUSSION

The age range of the patients studied was 20-83 years. Therefore it was a study of adult population.

In this study prevalence of FNP was found to be 0.95% which is lower than the incidence found in United Kingdom [12] female preponderance was also noted which is similar to a study by Prescott [13] but in contrast with other works where there was male preponderance [25,26] and some others equal sex distribution [9,14].

The mean age of the patients studied was 48.9±14.1 in contrast ,the study by Afolabi et al was on younger population with a mean age of 32.1 years hence the age range 30-40 years had the highest presentation while in the present study, age 50-59 was the most affected [25] and Hasan et al found age 20-25 years more affected [10]. The present finding is closer to the work by Cha et al. with mean age of 42.1 ± 21.5 with
highest incidence found in age range 46-60 years [18].

While commonest presenting complaints was facial weakness, outright facial deviation was noted in 17.1%, the left side was more affected. Other works found the right more affected [25,26,27] while some found equal affectation [13].
Upper motor neuron lesion was seen in 80.3%, it was the commoner lesion, and this however is different from the findings recorded in some other works where lower motor neuron lesion is commoner. Afolabi et al had 88% of LMNL but only 12% UMNL [25] this could be because in this present study Bell’s palsy which is a lower motor neuron lesion was not as high as was seen in other works. The facial nerve palsy from detectable cause otherwise called secondary facial palsy was seen more than the idiopathic in this study. Hypertension was the commonest cause of FNP in this study, may explain therefore the UMNL being the commonest type seen. In contrast, Afolabi et al had only 8% of their cases caused by hypertensive CVD [25], however, Lamina et al had 30.0% and it was the second highest cause in their study [28]. It was also noted that while diabetes mellitus and bell’s palsy were second commonest cause, the diabetic patients were also found to have hypertension. Contrary to this finding some other workers found infective causes to be commoner [2,25,29]. However their studies was on children while Wang et al. found bell’s palsy to be commoner [27] Peiterson E found other causes of FNP less common than bell’s palsy [9]. In the present study diabetes was found as a cause in 11.8% of the patients this could lay credence to a finding that facial nerve is sub clinically involved.
in 6% of diabetic patients [30] and in an appreciable number of patients with bell’s palsy, overt diabetes was also found [31] even though this does not mean a higher rate of diabetes among patients with bell’s palsy than that expected in the general population [31]. While trauma was found to be an appreciable cause by some studies, it was found only in one patient [27,32,33]. There was no record of iatrogenic causes unlike other studies [7,34].

Majority of the patients were treated medically. The hypertensive as well as the diabetics improved as the blood pressure and sugar control got better with medications. Some of them also had physiotherapy in addition. Steroid was the main medication used for all the Bell’s palsy patients. This also agrees with other works [35]. An appreciable number also had physiotherapy. Those that presented late, some weeks after onset of palsy had the steroids in combination with physiotherapy; blowing balloon and chewing gum. Only one patient had surgical intervention and that was mainly for the primary condition. Various modes of treatment have been employed in this condition. While some researchers advocate steroids only, [35] some others found it better when in combination with low molecular dextran [36] yet others found steroids in combination with antiviral such as valacyclovir, better [37] others in contrast found steroids not beneficial [38,39]. It is known that without treatment, percentage of patients with bell’s palsy will have a fair recovery but 20-30% will have varying degrees of permanent disability [40,41].

Overall, majority did well while 30.3% had poor recovery with some lost to follow up. The age group 50-59 had the greatest number of good outcome in contrast with the finding that the younger the patient, the better the prognosis [42] but outcome appears more favorable in children [20] this contrast may be because we studied only the adult population and this finding is only apparent since this age group 50-59 was the most affected. However it is similar to the finding by Cha et al where age 46-60years had 90.8% recovery and age 31-45 years had 85.7% [18].

Although UMNL is more in number, patients with LMNL had a significantly (P=0.026) higher proportion of good outcome in comparison to UMNL (93.3% versus 63.9%). It has been documented that in FNP caused by hypertension, there appears to be an association between blood pressure control and resolution of FN [43].

The proportions of aetiological factors when compared with outcome showed statistical significance with P-value= 0.0001. Almost all the infective causes though small in proportion, all had poor outcome. While in contrast hypertension almost all had good outcome. A plausible explanation for this could not be found however, it is possible that these patients as is customary in our environment may have presented late thereby allowing the nerve damage to progressively worsen making it difficult to have a full recovery.

5. CONCLUSION

Facial nerve palsy in this region appears not to be rare and detectable causes such as hypertension is more implicated. Most patients did well on treatment with steroid. The type of lesion significantly determines the outcome and prognosis.

6. LIMITATIONS

There was no classification of grades of the palsy using house and Brackman which would have helped to determine the severity of the lesion because it was retrospective and were often not documented. The sample size is small therefore the findings will have to be cautiously implied.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval was obtained from the ethical committee of the hospital.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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