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Otorhinolaryngological Disorders Implicated in Facial Nerve Paralysis in a Tertiary Hospital in Port Harcourt

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Authors' contributions

This work was carried out in collaboration between the authors. Author IMU designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript while author AEU managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Background: It is not all facial nerve palsy that presents to the otorhinolaryngologist that is Bell's palsy; therefore there is a need for proper evaluation of these patients. This study is to determine the pattern and prevalence of otorhinolaryngologic disorders associated with facial nerve paralysis.
Aim: To determine the prevalence and pattern of otorhinological disorders implicated in facial nerve paralysis in University of Port Harcourt Teaching Hospital.
Patients and Methods: Study design: This was a hospital-based descriptive study. The patients diagnosed with facial nerve paralysis seen in the Ear Nose and Throat surgery and Physiotherapy departments of the University of Port Harcourt Teaching Hospital (UPTH) from January 2014 to December 2018 were collated and those among them with associated otorhinolaryngological disorders were recruited and studied. Data on patient demographics, presenting complaints and

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ear nose and throat disorders were sought from the case files, clinic and ward registers. Data entry was done using Microsoft Excel and exported to United States CDC Epi-Info version 7 for data analysis. Frequency tables and appropriate charts were used to present data. Chi square statistics was performed to determine significant differences between demographics of the patients and category of facial nerve palsy patients at alpha level of 0.05.

Results: 76 patients with facial nerve paralysis, twenty one of them were associated with ORL disorder giving a prevalence of 27.6%. Ages below 40 years were the most affected and a slight male preponderance. Acute and chronic otitis media were seen in 33.3% of these patients respectively while Ramsay hunt syndrome and otitis externa were seen in 9.5%. Age and incidence of ORL disorders in these patients had statistical correlation.

Conclusion: ORL disorders associated with facial paralysis are still prevalent and otitis media appear to be the most common.

Keywords: Otorhinolaryngology; facial nerve paralysis; otitis media.

1. INTRODUCTION

The facial nerve is one of the cranial nerves that run a long course from the intracranial origin to its areas of supply. It can therefore become compromised at any point along its course by various adverse conditions with resultant deficit in its functions. The facial nerve gives motor innervation to the muscles of facial expression; orbicularis oris, oculi, frontalis etc., and the stapedius muscle [1]. It also gives parasympathetic supply to the lacrimal and submandibular glands and sensory to the anterior two third of the tongue. Therefore paralysis of this nerve does not only result in loss of facial expression but also in dry eyes, decreased corneal reflex drooling, hyperacusis, otalgia and speech articulation problems among other things [1]. It therefore results both in functional and cosmetic impairment [2]. Facial nerve dysfunction therefore can severely affect a patient's quality of life.

The incidence of facial nerve paralysis is about 20-30 cases per 100,000 people [3] and in most of the facial nerve paralysis (FNP), the cause is not known. Hence they are termed idiopathic or referred to as Bell's palsy which accounts for about 70% of the FNP seen [4]. It accounts for 90% of the facial nerve paralysis seen in children [5]. FNP can also have known aetiological factors such as trauma, neoplasia and infections. Infections such as herpes zoster, otitis media, rubella, HIV and meningitis have all been implicated in facial nerve paralysis [6]. Siwula and Mathieu found that in the USA in the past, bacterial infection of the middle ear was a common cause of facial nerve paralysis however this is no longer so in recent times [7]. Facial nerve palsy can be a complication of otorhinolaryngological (ORL) conditions such as acute otitis media, chronic suppurative otitis media, mastoiditis, meningitis and cholesteatoma [8]. It is known that incidence of facial nerve palsy secondary to chronic otitis media has decreased with antibiotic use but its prevention is still a challenge [9] hence it is still prevalent with an incidence of 1-3% [10] Facial nerve palsy in acute otitis media on the other hand is rare in the recent era with estimated incidence of 0.005% [11]. Formerly in the pre-antibiotic era, it had an incidence of 0.5.-0.7% [11] It is commoner in children and is attributed to poor immunological response [11] but has very good prognosis with a full recovery in most cases [3]. The facial nerve palsy in these conditions is thought to be due to intra-fallopian inflammatory oedema with resultant ischaemia and neuropraxia. This could result from any factor that brings a change in the microenvironment of the middle ear such as; osteitis, acute inflammations, elevated pressures or reactivation of viruses within the bony facial canal [12] especially in patients with decreased immunity [13]. It can also be due to a direct involvement of the nerve by bacterial or viral toxins [14].

While some studies noted that about 4% of facial nerve paralysis can be attributed to infections such as acute otitis media, chronic suppurative otitis media (CSOM) and malignant otitis externa, [15] some other researchers reported an incidence of less than 3% of chronic otitis media with or without cholesteatoma being associated with facial nerve paralysis [16] it is known that chronic otitis media when complicated by facial nerve paralysis ,often could indicate the presence of cholesteatoma [3] however, acute mastoiditis with prior CSOM, can develop complete or incomplete acute FNP even without

cholesteatoma [17]. In general, facial nerve paralysis associated with chronic ear infection is an indication of an advanced lesion [18].

Herpes zoster which is another infection that can be complicated by FNP is usually latent in the geniculate ganglion but when reactivated could result in Ramsay hunt syndrome; an acute facial paralysis with severe otalgia and vesicular eruptions in the external auditory meatus. Only about 50% of these patients have complete recovery [19]. Ramsay hunt syndrome is the second most common cause of FNP. It requires early and correct treatment to avoid permanent sequeale [20]. It has an incidence of 5cases per 100,000 people [21] and spontaneous recovery is rare, without treatment, only 20% will achieve complete recovery [22]. It is also know that patients older than 60years with this condition have delayed recovery of the FNP when compared with the younger patients [23,24]. It has also been found out that some patients diagnosed as idiopathic facial nerve paralysis could actually be suffering from a form of herpes zoster called zoster sine herpete; a form with the pains but without the rash but there is presence of increased titre of varicella zoster virus (VZV) antibody [25].

2. PATIENTS AND METHODS

It is a retrospective hospital based descriptive study involving all patients with facial nerve paralysis with ORL disorders seen in the ear nose and throat clinic and the physiotherapy department of the university of Port Harcourt teaching hospital from January 2014 to December 2018. The patients` case files, clinic and ward registers were the source of data. Data on patient demographics, presenting complaints and diagnosis of ORL disorders associated with the facial nerve paralysis were sought from these records. Patients with incomplete information relevant to the study such as diagnosis, clinical features, treatment etc were excluded. Ethical approval was obtained from the ethical committee of the hospital. Patients with facial paralysis that is not of otorhinolaryngological (ORL) disease origin were not studied.

Statistical analysis: Data entry was done using Microsoft Excel and exported to United States CDC Epi-Info version 7 for data analysis. Frequency tables and appropriate charts were used to present data. Chi square statistics was performed to determine significant differences between demographics of the patients and category of facial nerve palsy patients (with/without ENT disorders) at alpha level of 0.05.

3. RESULTS

There were 76 patients with facial nerve paralysis studied. ORL disorders were found in 21 of these patients giving a 27.6% prevalence (Fig. 1). The age ranged from 20-80 years. There were 11 males and 10 females. Patients aged 40 years and below accounted for most of the cases Table 1.

The commonest symptom recorded among these patients was otalgia followed by impaired hearing Table 2.

Otitis media, both acute and chronic (33.3%) was the most ORL disorder commonly associated with facial nerve paralysis in these patients. The second commonest disorder was herpes zoster with Ramsay hunt syndrome 9.5%. Otitis externa was also seen in 9.5% of the cases Table 3.

Facial nerve palsy patients aged below 40 years had a significant higher proportion of ORL disorders than those aged above 40 years with P value of p=0.042 Table 4.

Two of the patients with Ramsay Hunt and three with CSOM had retroviral disease (RVD) in addition.

Table 1. Age distribution of the patients

	Facial nerve palsy patients		
Variables	**With ENT disorders N=21 n (%)**	**Without ENT disorders N=55 n (%)**	**Total N=76 n (%)**
Age			
< 40 years	11 (50.0)	11 (50.0)	22 (100.0)
40 – 49 years	3 (27.3)	8 (72.7)	11 (100.0)
50 – 59 years	4 (14.3)	24 (85.7)	28 (100.0)
≥ 60 years	3 (20.0)	12 (80.0)	15 (100.0)

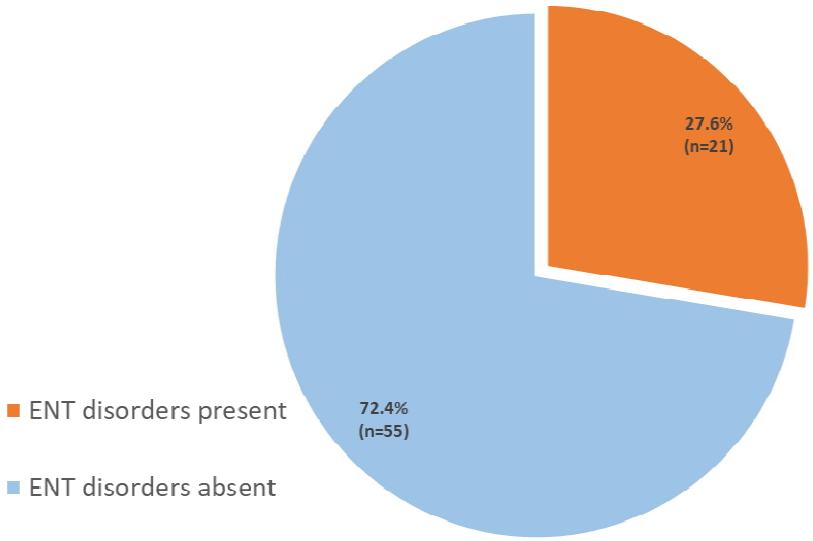

Fig. 1. Occurrence of ENT disorders among patients with facial nerve palsy

Table 2. ENT symptoms among facial nerve palsy patients (N=21)

Variables	Number	%
Otalgia	10	47.6
Impaired hearing	4	19.0
Ear discharge	3	14.3
Dysphagia	2	9.5
Jaw pain	1	4.8
Nose bleeding	1	4.8
Throat pain	1	4.8

**Some of the patients had more than one complaint*

Table 3. ENT diagnoses among facial nerve palsy patients with (N=21)

Diagnoses*	Number	%
CSOM	7	33.3
AOM	7	33.3
Otitis Externa	2	9.5
Ramsay-Hunt Syndrome	2	9.5
Herpes Zoster	1	4.8
Chronic Rhinosinusits/anterior uveitis	1	4.8
Acute Tonsillitis	1	4.8
Sionasal cancer	1	4.8
Sensorineural hearing loss	1	4.8

**Some of the patients had more than one diagnosis*

Among these patients with ORL disorders, except for the patient with acute tonsillitis, the facial nerve paralysis seen were all of the LMN type and the left side were more commonly affected than the right. Majority was treated medically and chewing gum, blowing balloons with massages were the main stay of the physiotherapy received by these patients in addition to treating the primary ORL pathology. Those with viral disease such as herpes zoster and Ramsay hunt had antiviral therapy and HAART as well. The patients with acute otitis media were treated with 50 mg/kg of parenteral ceftriaxone daily for 3 days then with improvement was changed to oral amoxiclav for 5 days. This was combined with oral prednisolone 10 mg 12 hourly for 5 days and in most, the facial nerve resolved without sequeale.

Table 4. Comparison of demographics (age/sex) by category (with/without ENT disorders) among patients with facial nerve palsy

	Facial nerve palsy patients		
Variables	**With ENT disorders N=21 n (%)**	**Without ENT disorders N=55 n (%)**	**Total N=76 n (%)**
Age			
< 40 years	11 (50.0)	11 (50.0)	22 (100.0)
40 – 49 years	3 (27.3)	8 (72.7)	11 (100.0)
50 – 59 years	4 (14.3)	24 (85.7)	28 (100.0)
≥ 60 years	3 (20.0)	12 (80.0)	15 (100.0)
Fisher's Exact = 7.904; p-value = 0.042*			
Sex			
Male	10 (31.2)	22 (68.8)	32 (100.0)
Female	11 (25.0)	33 (75.0)	44 (100.0)
Chi Square = 0.362; p-value = 0.547			

**Statistically significant*

4. DISCUSSION

In this study prevalence of ORL disorders implicated in facial nerve paralysis was 27.6%. In contrast, Junior et al. had 12.9% of their 54 cases of facial nerve paralysis being caused by ORL disorders [3]. There was also a slight male preponderance similar to other studies [3,26]. The study was on adult population with age ranging from 20-80 years and highest incidence was found in patients below 40 years, similar to other studies [26]. In the present study, otitis media was the most implicated ORL condition in facial nerve paralysis. Similarly in a study in Kano, it was found to be the third commonest cause of facial paralysis [26]. In contrast, Wang et al in their study found otitis media with facial nerve paralysis to be commoner in children below 2 years while Folayan et al found it to be more in adolescents [27,28]. The prevalence of 33.3% of acute otitis media associated with facial paralysis found in this study appears higher in comparison to the study of Junior et al that has 3.7% [3] it is also in contrast to the studies of Sinhg and Ranjit as well as Celik and Turkoz that showed facial nerve paralysis complicating acute otitis media to be rare [29,30]. However it is similar to a study in Oslo where 56% of their patients had acute otitis media associated with facial nerve paralysis [14,31]. This could be because these studies were on facial nerve paralysis associated with ORL diseases only and not just on every form of facial paralysis like in most other studies. These patients; both those with intact as well as those with perforated tympanic membrane, were treated mainly conservatively with parenteral broad spectrum antibiotics, high dose corticosteroids and physiotherapy. Majority resolved completely. Some other researchers also managed conservatively with similar results [15,26,31, 32,33].

Chronic suppurative otitis media (CSOM) associated with facial palsy also accounted for 33.3% of the cases seen. This prevalence is also high in contrast to other studies [10,14,34]. It is known that facial nerve paralysis is seen often in CSOM with or without cholesteatoma [10]. Even though different researchers found varying incidences of cholesteatoma in similar studies; Yetiser et al. had 67% while Altunas et al. had 70%, we found none in the present study [10,35]. this could lay credence to studies that postulate that Africans have low incidence of cholesteatoma [36,37] therefore these patients did not have any elaborate facial nerve surgery carried out. However they had treatment for their primary ORL disease; medically, few had surgical intervention as well as physiotherapy done. Few resolved completely. Chronic otitis media is still a disease of low socioeconomic background and the high incidence means that there is still a need for improvement of standard of living of the general populace as well proper public enlightment concerning the disease because the facial nerve paralysis complication indicates an advanced lesion [18].

The patients with Ramsay hunt syndrome and Herpes zoster accounted for 14.3% of the cases similar to the 12% found by Uri et al. [23] Sweeney et al also recorded high incidence [25]. This condition is often associated with facial paralysis [20]. These patients had retro viral disease (RVD) in addition therefore had treatment for this as well as corticosteroids and physiotherapy for the facial nerve paralysis. They

had poor resolution of the palsy. This agrees with other researchers [20,21,22].

Acute tonsillitis is rarely associated with facial nerve paralysis except when it is complicated by major central neurological sequeale that could include superior sagittal sinus thrombosis, hemiplegia, as well as facial nerve palsy [38]. This study recorded one case. The patient with chronic rhinosinusitis also had an anterior uveitis and was treated with parenteral antibiotics and corticosteroids with good result. This patient may have had incomplete Heerfordt-waldenstrom syndrome, however was lost to follow up before this could be ascertained [39].

In general, ORL conditions associated with facial paralysis are mainly infective in nature with otitis media being the most implicated. In addition, the facial paralysis improved with treatment especially the patients with acute otitis media .A good number however did not have complete resolution and these were among those with CSOM, Ramsay hunt and Herpes zoster.

There was statistical significance between ages less than 40 years and presence of ORL diseases associated with facial nerve paralysis.

5. CONCLUSION

ORL disorders associated with facial nerve paralysis are still prevalent in our environment. Otitis media that has the incidence almost becoming negligible in other climes, appear to still be of significant public health relevance in our society due to poverty. Viral diseases including RVD were all found to be relevant causes of facial nerve paralysis.

6. LIMITATIONS

There was no proper classification or grading of the FNP in all the patients.

CONSENT

As per international standard or university standard written respondent consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval was obtained from the ethical committee of the hospital. Patients with facial paralysis that is not of otorhinolaryngological (ORL) disease origin were not studied.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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