



*Research Paper*

**EAR NOSE AND THROAT CONDITIONS SEEN IN PREGNANT WOMEN ATTENDING ANTENATAL CLINIC IN A TERTIARY HOSPITAL IN PORT HARCOURT**

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**Abstract**

A cross sectional descriptive study carried out among pregnant women attending the antenatal clinic in University of Port Harcourt teaching hospital. It used a semi structured and self-administered questionnaire from February 2019 to January 2020. All the pregnant women that gave their consent were recruited into the study; they also had complete ear, nose and throat physical assessment carried out. Ethical approval was sought and obtained from the hospital ethical committee. Data obtained was analyzed using the IBM SPSS version 25. There were altogether 150 respondents. The age ranged from 20-49 years with a mean age of 31.3+/- 5.2. Age range 30-39 years comprised the majority of the study population. Majority of the women were schooled up to tertiary level of education 78.67%. Most were in the second and third trimester; 46% and 31% respectively. Heartburn was the commonest complaints, seen in 17.33%. This was followed nausea and itching in the ears in 12.0% and 7.3% respectively. The commonest ENT conditions were; otitis media with effusion 21.3% and reflux laryngitis/oesophagitis 21.3% followed by rhinitis in 20.0%. Ear problems were seen in 36.7% while the least was the throat region with 28.0%. In the ear, otitis media with effusion and Meniere's disease were the commonly found conditions. Respondents between 30 - 39 years have a higher proportion of ear conditions (18.67%). Distribution of Ear findings by age groups and level of education was not statistically significant. However it was significant by trimester of pregnancy. In the throat, Reflux laryngitis and oesophagitis were the commonest conditions, occurring more in the age 20-29 (60.0%) as well as pharyngitis (56.3%). The distribution of throat diagnosis by trimester was statistically significant ( $p < 0.05$ ). Ear nose and throat conditions are common in pregnancy. Ear problems were the commonest with otitis media with effusion being the highest otologic

condition. While allergic rhinosinusitis and rhinitis were the most nasal conditions recorded. Reflux laryngitis and oesophagitis were seen in the throat. These conditions significantly relates to the trimester of pregnancy and in some instance to age.

Key words: Ear nose and throat, changes, pregnancy, otitis media.

## INTRODUCTION

The basic physiologic changes that occur in pregnancy are metabolic and hormonal. There is increase in basal metabolic rate resulting in an increased oxygen consumption leading to increased cardiac output and expansion of blood volume with associated increase in the total body water. Some of these changes are trimester dependent; in the first and second trimester, it is the plasma volume that is increased while in the 3<sup>rd</sup> trimester it is the extravascular volume that is increased. The result of all these are boggy mucous membrane and dependent extremity oedema. [1]

There is also hormonal changes; oestrogen and progesterone peaks during the 3<sup>rd</sup> trimester. This invariably brings changes in the nasal, laryngeal and gingival mucosa. There is also a relative immunosuppression seen in pregnancy due to increase in serum cortisol. This could give rise to reactivation of latent viral infections. [1] most of the ear, nose and throat conditions seen in these women often result due to these two major changes above.

Evidence available appears to suggest that ear problems may be increased in pregnancy. [2] In the ears, the relative immunosuppression can give rise to ear conditions such as otomycosis. [3] and the Eustachian tube dysfunction that arises due to mucosal oedema with its obstruction or patulous Eustachian tube giving rise to conditions such as otitis media with effusion, [4] Meniere's disease which may be due to fluid retention. [5] Hearing loss has also been noted in pregnant women which could be due to the Eustachian tube dysfunction [4] and also due to hypercoagulable state which can lead to vascular occlusion of the microcirculation of the inner ear resulting in sudden onset of deafness, [6] it can also result from toxemia of pregnancy. [7] Tinnitus has also been seen in pregnancy and it appears to be an early warning sign of gestational hypertension or pre-eclampsia as such pregnant women who complaint of tinnitus should be closely monitored for hypertension in pregnancy. [8 , 9] some of these conditions such as otitis media with effusion can resolve after parturition.[10 ,11]

The vascular engorgement and increased mucous gland activity which is worse in the third trimester tends to worsen the nasal discharge and blockage in these women.[12]

this pregnancy rhinitis which occurs in about 22% of women can begin at any trimester.[13] Existing evidence suggests that it could be due to increase in sensitization to allergens in these women who have a pre-existing subclinical allergy.[14] The female sex hormone has also been implicated in the aetiology. [15] Allergic rhinosinusitis and rhinitis are about the commonest nasal disease in pregnancy. [16, 17]They are also associated with snoring and obstructive sleep apnoea. Epistaxis during pregnancy is common occurring in up to 20% of pregnant women as compared to about 6% of non- pregnant women. [18] It is attributed to increased vascularity and vascular congestion. It can appear in early pregnancy and often not severe except it is due to hemangioma or granuloma which can sometimes be seen in pregnancy. [19] Other causes include hypertension and toxemia of pregnancy. [20]

In pregnancy, the hormones progesterone and oestrogen has smooth muscle relaxing effect and this can cause decrease in the tone of the oesophageal sphincters which could lead to reflux of the stomach contents into the oesophagus, larynx and pharynx. This is worsened by the decreased gastric emptying time and increased intestinal transit time seen in pregnancy as well as pressure from the growing foetus. The result is oesophagitis and laryngitis due to mucosal injury to the upper aerodigestive tract, which gives rise to clinical symptoms such as heart burn and hoarseness in these patients. [21] Often, patients with laryngopharyngeal reflux [LPR] may not experience heart burn or show signs of oesophagitis. The threshold of acid required for laryngeal epithelial injury is much lower than that for the oesophageal epithelium. [21] It manifests clinically as posterior laryngeal oedema and erythema which gives rise to complaints of chronic throat clearing, hoarseness, cough and sensation of something in the throat from the patients. [21] History and clinical examination is enough to make a diagnosis of LPR. Acid reflux disorders is seen in about 30-50% of pregnant women.[22] The voice change can also be attributed to alterations in the fluid content of the laryngeal lamina propria just below the mucosa which is believed to be as a result of the hormonal changes in pregnancy. This is also known as laryngopathia gravidarum.[23] However, these changes seen in the ear, nose and throat of these women in pregnancy are often temporary and tend to resolve after delivery but a few may persist necessitating referrals to an ENT surgeon. Quite often these complaints are ignored by the primary care givers or the women themselves attributing them to normal problems seen in pregnancy but these can affect the quality of life of these women adversely.

Hence this study seeks to correct this so as to ensure prompt referrals of these women to appropriate care so as to obtain the required treatment. The findings could form a baseline for modifying and possibly preventing any of the adverse changes in these women.

### Patients and methods

A cross sectional study carried out among pregnant women attending antenatal clinic in University of Port Harcourt teaching hospital from the period of February 2019 to January 2020. A semi structured questionnaire was administered to all the pregnant women attending the antenatal clinic who consented to being a part of the study within the period. Those recruited had ear nose and throat clinical assessment carried out. The information sought with the questionnaire included, demographics and trimester of pregnancy, parity, clinical symptoms, and ear, nose and throat problems. Only those that gave their consent were included in the study. Ethical approval was sought and obtained from the hospital ethical committee. Those with ear nose and throat problems prior to the pregnancy were excluded

The data obtained was analyzed with the SPSS version 25 software. The demographic information, distribution of symptoms and diagnosis of the ear, nose and throat were presented in frequency and percentages as appropriate. The Chi-square statistic was used to assess the association of the different diagnoses and demographic information of the respondents. All analysis was done at a 95% confidence interval and a p-value less than 0.05 was considered significant.

Sample size calculation:

The sample size was calculated based on the prevalence of 9% as reported by Mgbe et al. (2017) with the sample size for proportions as stated by Araoye (2008) below

$$n = Z^2pq/d^2$$

where;

n = sample size for Case and Control

Z = 95% confidence interval= 1.96

P = proportion of the target population used=78%

q = 1.0 – p = 1.0 – 0.09 = 0.91

$d$  = degree of accuracy desired (usually set at 0.05)

$$n = \{(1.96)^2 \times (0.09) (1.0 - 0.09)\} / 0.05^2$$

=125 + 10% attrition rate ~140 subjects.

This was subsequently rounded off to 150 pregnant women attending ante-natal care in UPTH.

## RESULTS

There were altogether 150 respondents. The age ranged from 20-49 years and a mean age of 31.3+/- 5.2 the age range 30-39 years comprised the majority of the study population. Majority of the women were schooled up to tertiary level of education 78.67%. (table 1) Most of the women were in the second and third trimester; 46% and 31% respectively.(figure1)

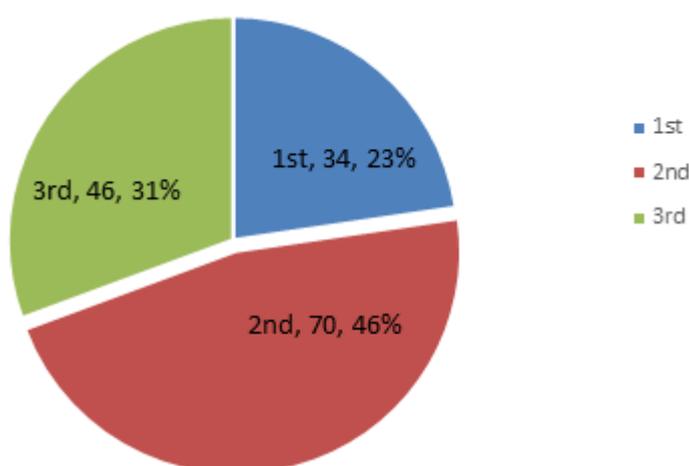
Heartburn was the commonest complaints, seen in 17.33% of the respondents. This was followed by feeling of nausea and itching in the ears in 12.0% and 7.3% respectively (table 2) The commonest ENT conditions noted in the respondents were; otitis media with effusion 21.3% and reflux laryngitis/oesophagitis 21.3% followed by rhinitis in 20.0% (table 3) Ear problems or changes were seen in 36.7% of the respondents while the least was the throat region with 28.0%. (table 4) In the ear findings, otitis media with effusion and Meniere's disease appear to be the commonly found conditions. Respondents between 30 – 39 years were found to have a higher proportion of ear conditions (18.67%). The distribution of the Ear findings by age groups and level of education was not statistically significant. However by trimester of pregnancy it was found to be statistically significant. Women in the 3<sup>rd</sup> trimester were found to have the highest proportion of the ear findings; 50.9% shown as CSOM (66.7%), otitis externa (60%), and otomycosis (50%) etc with p-value =0.008 (table 5) Rhinitis was the commonest nasal problem and age 30-39 was the group most affected 50%. Age distribution and trimester of pregnancy was statistically significant in nasal problems: p=0.025 and p=0.003 (p< 0.05). The respondents between ages 20 – 29 years had most of the nasal conditions (19.33%). They had allergic rhinosinusitis (77.8%) and those with epistaxis (100%) were also within this age range. Respondents in the 3<sup>rd</sup> trimester were found to have the highest proportion of (allergic rhinosinusitis) ARS (66.7%) While those in 2<sup>nd</sup> had the highest proportion of rhinitis (56.7%) and epistaxis

(33.3%) (table 6). In the throat, Reflux laryngitis and oesophagitis was the commonest condition, occurring more in the age 20-29 (60.0%) as well as pharyngitis (56.3%). The distribution of throat diagnosis by trimester was statistically significant ( $p < 0.05$ )(table 7)

In terms of management, the respondents were appropriately counselled, reassured where necessary and multidisciplinary approach was instituted with the primary managing teams for the safety and wellbeing of both the mother and the unborn child.

**Table 1: Demographic Information**

	Frequency (n=150)	Percentage (%)
<b>Age group</b>		
20 - 29 years	66	44.00
30 - 39 years	70	46.67
40 - 49 years	14	9.33
<b>Mean age <math>\pm</math>SD</b>	<b>31.3 <math>\pm</math>5.2</b>	
<b>Education</b>		
Primary	6	4.00
Secondary	26	17.33
Tertiary	118	78.67
<b>Number of Pregnancies</b>		
1 - 3	111	74.00
4 - 6	32	21.33
> 6	7	4.67



**Figure 1: Distribution of trimester of pregnancy**

**Table 2:** Distribution of symptoms among respondents

Symptoms	Frequency	Percentage
Blocking in the ear	2	1.33%
Feeling of water in the ear	2	1.33%
Bleeding from the nose	2	1.33%
Noise in the ear	3	2.00%
Discharging from the ear	4	2.67%
Voice change	8	5.33%
Dizziness	9	6.00%
reflux	10	6.67%
Headache	10	6.67%
Nausea	18	12.00%
Itching in the ears	11	7.33%
Itching in the nose	8	5.33%
Nasal discharge	8	5.33%
Heart burn	26	17.33%
Nose blockage	10	6.67%
Sneezing	8	5.33%

\*multiple responses apply

**Table 3:** Distribution of Ear, Nose and Throat findings among respondents

	Yes	No	Total
Epistaxis	2 (1.3)	148 (98.7)	150 (100.0)
Chronic suppurative otitis media (CSOM)	6 (4.0)	144 (96.0)	150 (100.0)
Otomycosis	4 (2.7)	146 (97.3)	150 (100.0)
Pharyngitis	10 (6.7)	140 (893.3)	150 (100.0)
Allergic rhinosinusitis	18 (12.0)	132 (82.7)	150 (100.0)
Meniere's disease	8(5.3)	142(94.7)	150 (100.0)
Otitis externa	5(3.3)	145(96.7)	150(100)
Rhinitis	30 (20.0)	120 (80.0)	150 (100.0)
Otitis media with effusion (OME)	32 (21.3)	118 (78.7)	150 (100.0)
Reflux laryngitis/oesophagitis	32 (21.3)	118 (78.7)	150 (100.0)

\*multiple conditions apply

**Table 4 : Prevalence of Ear, Nose and Throat Problems among respondents**

Presence of Problems	Ear (n,%)	Nose (n,%)	Throat (n,%)
Yes	55 (36.7)	50 (33.3)	42 (28.0)
No	95 (63.3)	100 (66.7)	108 (72.0)
<b>Total</b>	<b>150 (100.0)</b>	<b>150 (100.0)</b>	<b>150 (100.0)</b>

**Table 5: Cross tabulation of findings in the ear and Demographic Data**

Variables	CSOM (n = 6), %	Menieres (n = 8), %	OME (n = 32), %	Otitis Externa (n = 5), %	Otomycosis (n=4, %)	Good (n = 95), %	Chi- square (p- value)
<b>Age Group</b>							
20 - 29 years	2 (33.30)	3 (37.50)	10 (31.3)	0 (0.00)	2 (50.00)	49 (51.60)	<b>13.89 (0.178)</b>
30 - 39 years	4 (66.70)	5 (62.50)	17 (53.10)	5 (100.00)	2 (50.00)	37 (38.90)	
40 - 49 years	0 (0.00)	0 (0.00)	5 (15.60)	0 (0.00)	0 (0.00)	9 (9.50)	
<b>Number of Pregnancies</b>							
1 - 3	4 (66.7)	6 (75.0)	20 (62.5)	2 (40.0)	4 (100.0)	75 (78.9)	<b>13.36 (0.204)</b>
4 - 6	2 (33.3)	2 (25.0)	8 (25.0)	3 (60.0)	0 (0.0)	17 (17.9)	
> 6	0 (0.00)	0 (0.0)	4 (12.5)	0 (0.0)	0 (0.0)	3 (3.2)	
<b>Trimester of Pregnancy</b>							
1 <sup>st</sup>	0 (0.0)	1 (12.5)	2 (6.3)	1 (20.0)	0 (0.0)	30 (31.6)	<b>23.72 (0.008)*</b>
2 <sup>nd</sup>	2 (33.3)	4 (50.0)	14 (43.8)	1 (20.0)	2 (50.0)	47 (49.5)	
3 <sup>rd</sup>	4 (66.7)	3 (37.5)	16 (50.0)	3 (60.0)	2 (50.0)	18 (18.9)	

\*statistically significant (p < 0.05)

**Table 6:** Cross-tabulation of findings in the Nose and Demographic Data

Variables	Epistaxis (n = 2), %	Allergic rhinosinusitis (n = 18), %	Rhinitis (n = 30), %	Good (n = 100), %	Chi-square (p-value)
<b>Age Group</b>					
20 - 29 years	2 (100.00)	14 (77.78)	13 (43.33)	37 (37.00)	14.47 (0.025)*
30 - 39 years	0 (0.00)	2 (11.11)	15 (50.00)	53 (53.00)	
40 - 49 years	0 (0.00)	2 (11.11)	2 (6.67)	10 (10.00)	
<b>Number of Pregnancies</b>					
1 - 3	2 (100.00)	14 (77.78)	25 (83.33)	70 (70.00)	
4 - 6	0 (0.00)	2 (11.11)	5 (16.67)	25 (25.00)	6.15 (0.407)
> 6	0 (0.00)	2 (11.11)	0 (0.00)	5 (5.00)	
<b>Trimester of Pregnancy</b>					
1 <sup>st</sup>	0 (0.00)	0 (0.00)	4 (13.33)	30 (30.00)	
2 <sup>nd</sup>	2 (100.00)	6 (33.33)	17 (56.67)	45 (45.00)	19.93 (0.003)*
3 <sup>rd</sup>	0 (0.00)	12 (66.67)	9 (30.00)	25 (25.00)	

\*Distribution is statically significant (p < 0.05)

**Table 7:** Cross-tabulation of findings in the Throat and Demographic Data

Variables	Pharyngitis (n=10, %)	Reflux laryngitis/oesophagitis (n= 32, %)	GOOD (n = 108, %)	Chi- square (p- value)
<b>Age-groups</b>				
20 - 29 years	6 (60.00)	18 (56.25)	42 (38.89)	6.58 (0.160)
30 - 39 years	2 (20.00)	12 (37.50)	56 (51.85)	
40 - 49 years	2 (20.00)	2 (6.25)	10 (9.26)	
<b>No. of Pregnancies</b>				
1 - 3	10 (100.00)	20 (62.50)	81 (75.00)	5.79 (0.215)
4 - 6	0 (0.00)	10 (31.25)	22 (20.37)	
> 6	0 (0.00)	2 (6.25)	5 (4.63)	
<b>Trimester</b>				
1 <sup>st</sup>	0 (0.00)	0 (0.00)	34 (31.48)	19.51 (0.0001)*
2 <sup>nd</sup>	6 (60.00)	16 (50.00)	48 (44.44)	
3 <sup>rd</sup>	4 (40.00)	16 (50.00)	26 (24.07)	

\* Statistically significant (p < 0.05)

## DISCUSSION

There were 150 women studied and 36% of these have otologic conditions while 33.3% had nasal conditions and 28.0% had throat conditions, this altogether gives a prevalence of 98% of ENT changes or conditions in the study population. This means that ENT changes are common in pregnancy. The mean age of the women in this study was 31.3+/\_5.2 which is higher than an earlier study in Kano that had mean age of 28.57 years. It however agrees to a study in Benin (30.3years) and others in Brazil and India [9, 24, 25, 26] The age range 30-39 years made up majority of the study population in contrast to other researchers that had age range 25-29 years more affected [24] still some had 26-35 years being the commonest age group in their study.[25] Majority of the respondents were in their 2<sup>nd</sup> trimester of pregnancy different from that found in the Benin and Kano study where most of the respondents were in their 3<sup>rd</sup> trimester. [25,24] A very high proportion of these women had tertiary level of education 78.67% similar to the Kano study. This may explain the older age of the respondents in contrast to some other studies and the hospital being located in the Port Harcourt metropolis, an urban city, with highly educated women who will readily seek antenatal care.

Most of the ENT conditions were seen in the 2<sup>nd</sup> and 3<sup>rd</sup> trimester and ear problems appear to commonly occur in these pregnant women, seen in 36.7% as was seen in another study. [2] The highest otologic complaint was itching in the ears, seen in 7.3%. This was also noted by Ajiya et al and Onyeagwara et al. [24,25] The commonest ear condition among the respondents was otitis media with effusion ,similar to a study in Calabar however the prevalence in present study was higher.[27] The OME is thought to be as a result of mucosal oedema which is very common at this trimester of pregnancy coupled with resultant Eustachian tube dysfunction. In contrast, Al-zubiadi had otitis externa as the commonest otologic condition. Otitis externa with otomycosis ranked the second commonest otologic problem when joined together as otitis, [28] though the prevalence appears lower than the findings of other researchers. [24, 27] Al-zubaidi found the prevalence of otitis externa in pregnancy statistically significant. [28] It is believed to be due to an increase in sebum excretion that occurs at this time in the pregnancy. Meniere's disease which was seen in about 5.3% of the respondents is thought to be due to increased fluid retention.[5] It is noted that the trimester of pregnancy appears to be the main factor that impacts on ear findings since the majority

were found in the third trimester. This finding was statistically significant in contrast to similar studies.[24]

The nasal conditions among the respondents have a prevalence of 33%. While the commonest nasal complaint in this study was nasal blockage, it was the second commonest complaint in the study in Kano where nasal discharge was the commonest.[24] However on nasal assessment, rhinitis was the commonest condition in the present study. It could be as a result of the increased extravascular volume resulting in boggy nasal mucosa and therefore giving nasal congestion. The pregnancy hormones also affect the nasal musculature. Other researchers had it ranking second, possibly because they classified engorgement of the turbinates separately.[24, 27] Allergic rhinosinusitis ranked second in nasal conditions similar to the study in Iraq .[28] The age group 20-29 years had most of the nasal conditions. Epistaxis was seen in two respondents in this age group which was managed in the ENT department. There was therefore a statistical significant correlation between age distribution and nasal conditions in this study. The reason for this could not be ascertained readily however, it could be because at this young age, the hormonal impact is maximal. The trimester of pregnancy was also significant since majority of the nasal conditions were seen in the third trimester validating the effect of the pregnancy hormones and the metabolic change on the nasal mucosa. [1, 12]

In the throat, the complaints of heartburn, nausea, voice change and reflux were commonly seen. Heartburn alone accounted for 17.33% of the complaints. These were suggestive of gastro oesophageal reflux disease with the laryngeal component. These complaints were also noted in some other studies in Nigeria. [24, 25, 27] This finding was also similar to some studies internationally. [4, 29, 30, 31] It is significantly related to the trimester of pregnancy. The effect of the pregnancy hormones on the smooth muscles of the sphincters and the increased transit time of food through the gastrointestinal tract all combine to make these conditions common. These effects become heightened from the 2<sup>nd</sup> trimester with the peak seen in the 3<sup>rd</sup> trimester. [29]

It is known that some of these conditions are transient and will disappear postpartum. However, they can impact significantly on the maternal quality of life therefore should be taken seriously. The primary managing physician should know what to expect so as to provide better optimal medical care to these women.

## LIMITATIONS

The population studied was small so may not be able to generalize the findings to the wider population.

There is also possibility of bias on the answers from the respondents since the questionnaires were not validated and it was self-reported.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## CONCLUSION

Ear nose and throat conditions are common in pregnancy. Ear problem appear to be the commonest with otitis media with effusion being the highest otologic condition seen. While allergic rhinosinusitis and rhinitis were the most nasal conditions recorded. Reflux laryngitis and oesophagitis were seen in the throat. These conditions significantly relates to the trimester of pregnancy and in some instance to the age. However, when these pregnant women are attended to by caregivers and symptoms attributable to the ENT are made it seems they are made to think they are minor ailments and managed empirically and this may negate early diagnosis of a more serious ENT disorder and impact negatively on the quality of life for a longer period. Therefore the managing physicians should endeavor to look out for these conditions in their patients and promptly do a referral to the otorhinolaryngologist where necessary.

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