

CHRONIC SUPPURATIVE OTITIS MEDIA RISK FACTORS IN OUR SOCIETY**Abdul-Razzaq H Alrubaiee* & Ansam Ghazi Abdulwahed[®]***CABS, DLO, [®]MB,ChB. Department of E.N.T Al-Sadr Teaching Hospital Basrah-Iraq.**Abstract**

The prevalence of chronic suppurative otitis media (CSOM) is high worldwide. However, knowledge of associated risk factors is sparse; we report the sociodemographic and clinical risk factors of CSOM in our society in Basrah city with aiming to control the disease and complications; and putting possible preventive strategies.

The aim of this study is to determine the frequency of sociodemographic and clinical risk factors for development of CSOM in Basrah city, Iraq.

This is questionnaire-based survey included 100 patients having CSOM examined in Al-Sadr Teaching hospital outpatient department (68 females and 32 males), Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) program (Version 15.0). The difference between many variables was assessed to be statistically significant, by using tests of significance between two sample proportions.

Among those questioned, 33 patients (33%) were children below 14 years of age, 54 patients (54%) came from rural areas, 41 adult patient (61.1%) were either illiterate or just read and write, 20 patients of 14 years old or younger (60.6%) had mothers who were illiterate and 8 patients of this age group (24.2%) had mothers who could just read and write, 83 patients (83%) had low income, 51 patients (51%) of patients lived in congested (crowded) houses of 10 people or more, 44 patients (44%) were passive smokers, 55 patients (55%) had history of recurrent URI, 28 patients (28%) had history of allergic rhinitis and 18 patients (18%) had history of adenoid, 76 patients (76%) had onset of the disease at childhood, of whom 20 patients (20%) had age of onset below 6 months of age. The prevalence of CSOM was significant in age group below 14 years. With P value 0.017. Residency and feeding history were found to be not significant risk factors for development of CSOM, with P value of 0.427 and 0.394 respectively. Income was highly significant risk factor, P value 0.000. Family size of 10 and more was significant risk factor for development of CSOM with P value of 0.041. Clinical risk factors like history of URI, Allergic rhinitis and adenoid were found not significant risk factors.

In conclusion, Important risk factors for development of CSOM included sociodemographic factors like education level, income, congested (crowded) house with 10 and more people, presence of a smoker in the house hold, and early age of onset. Residency whether urban or rural did not have influence upon prevalence of CSOM, so did bottle feeding. Clinical risk factors like history of URI, allergic rhinitis and adenoid were found not significantly associated with the disease. The greater impact would be to sociodemographic risk factors on development of CSOM in our society.

Introduction

In early embryonic life, the first pharyngeal pouch on the inside expands due to the rapid growth of the surrounding mesenchyme and, after dragging in some of the second pouch endoderm, results in the formation of the Eustachian tube, middle ear and mastoid antrum. The endoderm of the slit-like sac that is the precursor of the middle ear lies against the ectoderm of the first pharyngeal groove by the fourth week. Mesenchyme grows in

between these two layers to form the middle layer of the future tympanic membrane. The ossicles develop from the outer ends of the first arch (Meckel's) and second arch (Reichert's) cartilages that lie above and below the first pharyngeal pouch. The middle ear cleft consists of the tympanic cavity, the Eustachian tube and the mastoid air cell system. The tympanic cavity is an irregular, air-filled space within the temporal bone between the

tympanic membrane laterally and the osseous labyrinth medially. It contains the auditory ossicles and their tendons that attach them to the middle ear muscles. Other structures, including the tympanic segment of the facial nerve, run along its walls to pass through the cavity. Physiologically the ear is divided into two parts-conducting apparatus, consisting of external ear, tympanic membrane, chain of ossicles, Eustachian tube and labyrinthine fluids; and perceiving (sensorineural) apparatus, consisting of end-organ (organ of Corti), auditory division of VIIIth cranial nerve, and central connections. Chronic suppurative otitis media refers to long standing discharge through a nonintact tympanic membrane either from a perforation or tympanostomy tube¹⁻⁴.

Most likely a result of earlier acute otitis media, negative middle ear pressure or otitis media with effusion. It classifies as active com, inactive com, and healed com. In UK the prevalence of healed, inactive and active COM was 12, 2.6 and 1.5 percent, respectively¹. In most of developed countries, including ours, the exact prevalence is unknown.

Patients and method

This is a descriptive study carried out in Basrah city, in Al-Sadr Teaching Hospital outpatient department between Jul 2011 to

March 2012 under the supervision of specialist in otolaryngology. One hundred patients were included in this study, all of them were diagnosed to have CSOM from history, clinical examination, otoscopy, and evaluation of hearing was also done by tuning fork and audiometry. A questionnaire form was used in this study included several sociodemographical and clinical parameters. Questionnaire was prepared after reviewing literature on the subject. There were 68 females and 32 males. All were questioned using the questionnaire seen next page.

Statistical analysis: All analyses were carried out with the Statistical Package for the Social Sciences (SPSS) program (Version 15.0).

Significance was evaluated between many variables using a test of significance between two sample proportions.

Results

After collection and analysis of data related to the studied population, we found that 23 patients (23%) with CSOM were below the age of 5 years, 10 patients (10%) were in age group between 6-14 years, 7 patients (7%) were between 15-17 years of age, 28 patients (28%) were between 18-35 years of age, 23 patients (23%) were between 36-55 years of age, and 9 patients (9%) were above 56 years of age.

Table I: Age distribution of the studied population

age	No.	%
0-5 years	23	23%
6-14 years	10	10%
15-17 years	7	7%
18-35 years	28	28%
36-55 years	23	23%
56 years>	9	9%
Total	100	100%

Accordingly, 33 patients (33%) were children of 14 years or younger, with P value=0.017, 7 patients (7%) were adolescents, 60 patients (60%) were adults of whom 9 patients (9%) were old age

(above 56 years old).

Regarding sex distribution of the studied population, it was found that 68 patient (68%) were females while 32 (32%) were males.

Table II: Gender distribution of the studied population

sex	No.	%
Male	32	32%
Female	68	68%
Total	100	100%

Regarding residency, 54 patients with CSOM (54%) are from rural areas, 46 patients (46%) are from urban areas. P value = 0.427

Table III: Distribution of the studied population according to residency.

Residency	No.	%
Urban	46	46%
Rural	54	54%
Total	100	100%

Regarding occupation of patients, 38 employers or unemployed, 9 (9%) were patients (38%) were housewives, 33 students, 8 (8%) were employers at a (33%) were children (below14) of whom stable job. 6 were in schools, 12 (12%) were self-

Table IV: Distribution of the studied population according to occupation.

Occupation	No.	%
Stable job	8	8%
Self -employer	12	12%
Housewife	38	38%
Student	9	9%
child	33	33%
Total	100	100%

The level of education of the 67 adult patients was evaluated and divided into levels, where 20 patients (29.8%) were illiterate, 21 patients (31.3%) could only read and write, 11 (16.3%) completed their primary education, 5 (7.4%) completed their secondary education, 10 (14.9%) had higher levels of education. Collectively, 41 patients (61.1%) were illiterate or just read and write, 26 patients (38.6%) finished primary school or higher. P value = 0.083

Table V: Distribution of adult studied population according to educational level.

education	No.	%
Illiterate	20	29.8%
Read and write	21	31.3%
Primary	11	16.3%
Secondary	5	7.4%
Higher	10	14.9%
Total	67	100%

On the other hand, children were studied according to the level of maternal education, where 20 patient (60.6%) had illiterate mothers, 8 (24.2%) had mothers who could just read and write, 4 (12%) of mothers completed their primary education, while only 1 (3%) completed her secondary education. There was no patient among children group whose mother's level of education higher than secondary school. Similar to above, 28 mothers (84.2%) were illiterate or just read and write, 5

mothers (15%) finished primary school or higher. P value = 0.000

Table VI: Distribution of children studied population according to the level of maternal education.

Education of the mother	No.	%
Illiterate	20	60.6%
Read and write	8	24.2%
Primary	4	12%
Secondary	1	3%
Total	33	100%

3.6 Regarding economic status, the monthly income of each family was estimated and divided by the number of family members to obtain the income of each patient individually, so called income per capita. We found 83 patients with CSOM (83%) had a monthly income of less than 100.000 I.D, 15 patients (15%) had an income between 101.000 and 200.000 I.D, while only 2 (2%) had an income higher than 201.000 I.D. P value = 0.000

Table VII: Distribution of the studied population according to Income per capita.

Income per capita (I.D)	No.	%
0-100.000	83	83%
101.000-200.000	15	15%
201.000-1000.000	2	2%
Total	100	100%

We also found that 51 patients (51%) lived in congested households (contain 10 members and above), 44 (44%) of them had a family size of 6-9 members, 5 (5%) had small families of 5 members or less. P value = 0.041

Table VIII: Distribution of the studied population according to Family size.

Family size	No.	%
0-5 members	5	5%
6-9 members	44	44%
10 members and above	51	51%
Total	100	100%

According to pattern of smoking, 44 patients (44%) had a smoker in the household (passive smokers), 39 (39%) were non-smokers, 11 (11%) were smokers, and 6 (6%) were ex-smokers. i.e., 55 patients (55%) were either smokers or passive smokers, and 45 patients (45%) were not smokers or quitted smoking for a period longer than one year (counted at the time of applying the questionnaire). P value = 0.32

Table IX: Distribution of the studied population according to the pattern of smoking.

Pattern of smoking	No.	%
Smoker	11	11%
Ex-smoker	6	6%
Non-smoker	39	39%
Passive- smoker	44	44%
Total	100	100%

According to feeding history, among the whole studied population, 79 (79%) had history of breast feeding, while 21 (21%) had history of bottle feeding. P value= 0.000

Table X: Distribution of studied population according to their feeding history.

Feeding history	No	%
Bottle feeding	21	21%
Breast feeding	79	79%
Total	100	100%

Regarding children below the age of 14 years, we found that 19 (57.6%) were bottle fed during infancy, while 14 (42.4%) had breast feeding. P value= 0.394

Table XI: Distribution of children in studied population according to their feeding history.

Feeding history	No.	%
Bottle feeding	19	57.6%
Breast feeding	14	42.4%
Total	33	100%

In the course of the study we also found that 55 patients with CSOM (55%) had history of upper respiratory tract infections more than 3 in the last 6 months. While 45 (45%) did not. P value= 0.32

Table XII: Distribution of studied population according to history of recurrent upper respiratory tract infection

URI	No.	%
history of URI	55	55%
No history of URI	45	45%
Total	100	100%

According to history of allergic rhinitis, 72 patients (72%) had no history of this condition while only 28 (28%) had positive history. P value = 0.0001

Table XIII: Distribution of studied population according to history of Allergic rhinitis.

allergy	No.	%
History of Allergy	28	28%
No history of Allergy	72	72%
Total	100	100%

We also found that 82 patients (82%) had no history of adenoid, only 18 (18%) had positive history for these conditions. P value= 0.000

Table XIV: Distribution of studied population according to history of Adenoid

Adenoid	No	%
History of Adenoid	18	18%
No history of Adenoid	82	82%
Total	100	100%

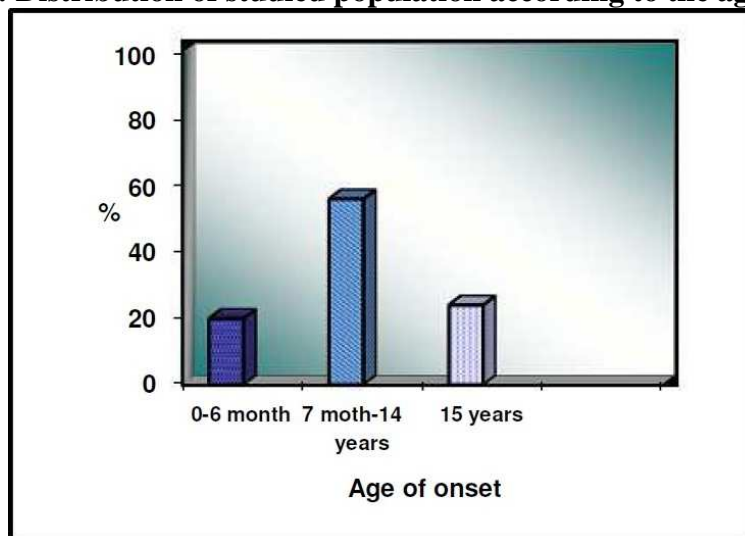
According to the age of onset of the disease, 56 patients (56%) had history of onset of CSOM at 7 months- 14 years of age, 24 (24%) had disease onset at age above 14 years, and only 20 (20%) had onset at 6 i.e., 20 patients (20%) had onset

of the disease at 6 months of age or earlier while 80 patients (80%) had onset at a later time of their lives. P value = 0.000

Table XV: Distribution of studied population according to the age of onset.

Age of onset	No	%
0-6 month	20	20%
7 month-14 years	56	56%
15 years and above	24	24%
Total	100	100%

Figure 1: Distribution of studied population according to the age of onset.



Discussion

Chronic suppurative otitis media has noticeable prevalence in our society, though limited studies have been done to illuminate various risk factors enhancing the development of the disease. In this study we found that 33% of our patients were younger than 14 years of age (children)⁴⁻⁸, with P value of 0.017.

Females comprised higher percentage of the studied population (68%) than males (32%), probably due to higher female population in Iraqi community according to the latest statistical account in Iraq where females were found to constitute 55% of population in our country, otherwise no clear explanation for this.

In our study we found no significant difference in the prevalence of CSOM between urban and rural areas, with P value of 0.427.

In this study we also distributed the patients according to their occupation, and

we found that 38% of patients were housewives, as there is high percentage of females in studied population, 33% were children, 12% were self employed or unemployed, 9% were students, 8% were employers in government or stable jobs.

In the course of study, we found an association between level of education and the disease, as we distributed adult patients according to their level of education we found that 29.8% of them were illiterate, 31.3% could just read and write, 16.3% completed their primary school, 7.4% completed their secondary study, and 14.9 had higher levels of education. i.e., 41 patients, (61.1%) were illiterate or just read and write, 26 patients (38.6%) finished primary school or higher. P value = 0.083

The relationship between education level and prevalence of CSOM was clearer in children below 14 years of age⁸⁻¹⁵, taking in consideration maternal educational

level, as a result we found 60% of patients belonged to illiterate mothers, 24.2% of mothers could only read and write, 12% completed their primary education, and only 3% completed their secondary education.

There was 83% of patients with very low income, less than the average known for the Iraqi citizen by the latest national statistical announcements, that is 90\$ monthly, about 100.000 I.D., while 15% had incomes within average (intermediate income), and only 2% had high income. This was statistically significant with P value of 0.000 jobs.

There was 83% of patients with very low income, less than the average known for the Iraqi citizen by the latest national statistical announcements, that is 90\$ monthly, about 100.000 I.D., while 15% had incomes within average (intermediate income), and only 2% had high income.

Taking family size in consideration (that is number of people living in the same house) distribution of the studied population revealed that 51% of patients lived in congested homes with 10 members and more, 44% had family sizes of 6-9 members, and only 5% had family size of 5 members or less. This was statistically significant with P value of 0.041.

Another factor was taken in consideration, that is smoking¹⁵⁻¹⁸, as it is a risk factor for several health related problems, the study population was distributed according to the pattern of smoking into 44% passive smokers, 39% non-smokers, 11% smokers, 6% ex-smokers. i.e., both smokers and passive smokers resemble 55% of the studied population. P value = 0.32.

History of bottle feeding¹⁹, when taken from the whole studied population, revealed 79% of patients with no history of such feeding pattern, while 21% had positive history of bottle feeding. P value = 0.000. When this was applied to children below 14 years of age only, taking in consideration that they are

usually accompanied by their mothers who gave a more factual history, we found that 57.6% of children with CSOM had history of bottle feeding, while 42.4% did not. P value = 0.40, higher percentage though not significant.

Clinical risk factors for development of CSOM were also considered, these are history of recurrent URI, allergic rhinitis, and adenoid diseases (adenoiditis/adenoidal hypertrophy). All of which found not to be significant risk factors for development of CSOM^{20,21}.

We found that 55% of patients had history of recurrent attacks of URI, while 45% did not. P value= 0.32. We found that 55% of patients had history of recurrent attacks of URI, while 4.11 We also found that 72% of the study population had no history of allergic rhinitis. P value = 0.0001.

Regarding adenoid, we found 82% of the studied population had no history of these conditions. P value = 0.000.

Lastly, 20% had age of onset at 6 months or younger, 56% had onset at age between 7 months and 14 years, and 24% had onset of the disease during adult life. So most of patients developed the disease during childhood, with small percentage before 6 months of age. P value = 0.000

Conclusion and recommendations

As an important health problem reflecting its effects on patient's health and quality of life, besides its financial burden upon individuals and governments, different risk factors were studied and identified to have significant impact upon the disease development and possibly upon its complications.

The most important among these risk factors were related to social and economic back ground of patients, as occupation, low income, low educational level, congested households, smoking, bottle feeding, and age of onset of the disease carry the biggest share of blame for development of CSOM in different countries, including ours.

Other risk factors like sex, residency, and malnutrition were found to have less effect on development of the disease. Clinical risk factors like URI allergic rhinitis and adenoid are not significant risk factors for development of the disease. We recommend that further studies should be carried out to confirm our results towards finding suitable solutions for the risk factors in order to decrease prevalence of the disease and its morbidity.

We also recommend that health education, improvement of housing conditions, family planning and encouraging breast feeding would have a good influence towards control of this disease and related illnesses. Finally, directing efforts towards elevation of living standards, economic status and education level of our people will certainly have its positive reflection not only on CSOM but all health problems in our society.

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