Aural Myiasis Associated with Chronic Suppurative Otitis Media Among Hilla Children .

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Abstract:

This study was carried out on thirteen patients whom suffering from chronic suppurative otitis media, all children-suspected with aural myiasis were attended to the ENT department of Hilla Teaching Hospital, during period of four consequent years (2004–2007) in the summer season (April through September). Their ages were ranged from 1– 0 years old, of both sex (7 males and 6 females). A quistionnaire paper was performed to each child which state his age, sex, residence, clinical symptoms and case history. All the patients in the field of present study were examined physically and clinically followed by laboratory parasitic examinations, then with the aid of CT scan and x-ray, they were had underwent suction clearance with the surgical intervention. A topical and systemic recommended antibiotics were subjected and formulated to each case of infection, and continued for six months up to their cure.

From the obtained results, it's revealed that all chronic suppurative otitis media patients were had middle ear inflammation. From these patients there are 77% were myiasis-infested patients. The first age group (1 – 3 years) was presented high myiasis parasitic infestation which was 46%. There are 54% of patients were males and 46% were females, respectively. Ten patients were lived in rural area more than those whom lived in urban area 77% and 23% respectively. The pathological findings that associated with all patients were: perforation of ear's tympanic membrane 100%, polyps formation in middle ear cavity 31% and formation of granulation tissue 46%. There were 23% of infected children were cured conservatively and 62% of them were of suction clearance with the surgical intervention.
The percentage rate of healing was 85%, since patients were seemed good and healthy.

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Key word :Aural Myiasis, Children, CSOM, ENT department, Hilla Teaching Hospital.

الخلاصة:

اشتملت الدراسة على 13 طفل يشك بأصابته بداء نغف الأذن , جميع الاطفال المرضى كانوا يعانون من التهاب الاذن الوسطى القيحي المزمن, جميعهم راجعوا استشارية قسم الانف والاذن والحنجرة في مستشفى الحلة التعليمي العام , خلال الفترة الزمنية لأربع سنوات متتالية (2004 – 2007) في فصل الصيف لتلك السنوات (نيسان – ايلول). تراوحت اعمار الأطفال المرضى من سنة الى عشر سنوات ومن كلا الجنسين (7 ذكور و6اناث). عملت استمارة استبيان لكل طفل مريض تبين العمر, الجنس, السكن, الاعراض السريرية و تاريخ الحالة المرضية لكل مريض. تم فحص جميع الأطفال المرضى فيزيائيا وسريريا و من ثم عملت الفحوصات الطفيلية لغرض التشخيص. تم توصيف و اعطاء المضادات الحياتية الموضعية و الجهازية المناسبة لكل حالة مرضية في حقل الدراسة. استغرق العلاج مدة 6 شهر لحين الشفاء التام بواسطة جهاز المفراس و الاشعة السينية فان اغلب المرضى قد خضعوا لعملية سحب و شفط للتراكيب التالفة و المتورمة و القيحية وكذلك بواسطة التداخل الجراحي اللازم لبعض الحالات المرضية. من خلال نتائج الدراسة المستحصلة تبين ان جميع مرضى التهاب الاذن الوسطى القيحي المزمن كانوا يعانون من التهابات شديدة للاذن الوسطى. تبين ان 77% من المرضى مصاب بداء النغف . اظهرت الفئة العمريةالاولى (1– 3 سنة) اكثر نسبة اصابة بداء النغف (46%). ظهرت نسبة عالية من المرضى من سكنة المناطق الريفية اكثر مما في المناطق الحضرية 77% و 23% على التوالي. الموجودات المرضية عند جميع المرضى كانت كما يلي: تثقب غشاء طبلة الاذن 100%, الزوائد اللحمية 31% , وتحبب مع تورم لبعض أنسجة الأذن الداخلية 46% على التوالي. تم شفاء 23% من حالات الاصابة تحفضيا فقط باستخدام المضادات الحياتية المناسبة دون اللجوء لحالات التداخل الجراحي و سحب التراكيب النسيجية التالفة من تجويف الاذن والتي كانت بنسبة 62% . اظهرت الدراسة الحالية نسبة عالية من الشفاء للمرضى والتي كانت 85% .

Introduction

Myiasis is the infestation of the organs or tissues of host animals by the larval stage of dipterous flies, usually known as maggots or grubs (Smith and Wall,1998). The fly larvae feed directly on host's necrotic or living tissue. The hosts are usually mammals occasionally birds and less commonly amphibians or reptiles (Smith and Wall ,1998 ; Köksol and *et al*, 2005). The term myiasis is derived from the Greek word myia meaning fly (Köksol and *et al*, 2005). Myiases are often classified according to the anatomical position or on the animal that the larvae infest. Broadly speaking, they may described as dermal, subdermal or cutaneous, nasopharyngeal, ocular, aural, intestinal and urinogenital myiasis (Smith and Wall,1998). Myiasis(screwworm) of human and other animals natural cavities are of tow groups; primary and secondary groups, the primary groups are green, blue or coppery-colored species of the family calliphopridae(blow flies) belonging to the genera"*calliphora ,phaencia ,phormia ,calliitroga* ,and others.The second group which is black and grey-colored species of the family sarcophagidae eg.*sarcophaga bullatta,phormia regina, lucilia sericata,chrysomia megacephala,chrysomia bezziana* and other species (Lee and Yong ,2008; Greenberg ,1984;Bosworth and Marshed,1984;Hayes and Wall,1998;Wall and Smith,1997; Nassir,2001; and World Organization for Animal Health,2007). Although human myiasis is not reportable, CDC'S Division of parasitic disease was notified of 24 cases from 15 states in 1984. in nine 38% of these, the larvae were found on stool examination. Four cases 17% were cutaneous. Three 13% aural; one 4% urinary; one 4% nasopharyngeal and six 25% from unspecified sites (GOP, 1985). The infestation of aural myiasis is common in the tropical regions and countries, especially in warmer months (summer seasons) (Koksal and *et al*,2005 and Sachdev and *et al*, 1990). The misery of this disease is generally associated with clinical signs and symptoms, systemic disorders, carcinoma cases, chronic suppurative otitis media, tympanitis, mastoiditis and other middle ear cleft inflammations (Köksal, and *et al*, 2005 ; Gopalakrishnan, and *et al*, 2008; Hayes and Wall ,1998 ; Geary and *et al* ,1999 and Lee and Yong ,2008). The occurrence and site of invasion of myiasis vary with environmental factors. Also, infestations are very common in the navels of newborns, the vulval and perineal region of their dams (Hall, MJ and Wall R, 1995 ; World Organization for Animal Health (OIE), 2007 ; Jains,S and *et al*, 2008). In addition, if the fly female deposits its eggs on mucous membrane, the larvae may enter any orifice including the nostrils, sinuses, mouth, orbits of the eye, ears or genitalia (Al-Mayaly, 2006; Lee and Yong,2008). In the note of worth, aural myiasis is a rare clinical state and occurs frequently in children and most of children with aural myiasis are associated with chronic suppurative otitis media (csom), (GOP, 1985 and Nassir ,2001). A perforated ear drum with hearing loss is one of the sequelae of chronic middle ear infection and the simple perforation of tympanic membrane without other lesions of the middle ear is a transforming mechanism with different effect in the ear systems physiology (Lee and Yong, 2008 and Nassir ,2001). Also, the csom is a chronic inflammatory process of slow and insidious course, which to be persistent and oftenly destructive with, same time, irreversible damage (Booth,1987 ; Lee and Yong,2008). The clearance of csom usually occurs, but if did not happened granulation tissue may be formed as an end result. Further that, mucosa become hyperplastic and invaded by fibroblast and chronic round cells (Al-Agilly, 2000 and Nassir ,2001). Virtually, there are three main pathological types of csom, these are: inactive chronic otitis media, active mucosal chronic otitis media and active chronic otitis media with cholesteatema (Al-Agilly ,2000).

Patients and methods

Patients:

A study was conducted on thirteen ENT out patients of both sex, whom suffering chronic supportive otitis media in Hilla Teaching Hospital (department of ENT). For the period of four consequent years (warmer months) April through September (2004 – 2007). Their ages were ranged from 1 -10 years old . According to Gill and Obrien , 1988 Patients were divided into three groups , 1–3, >3–5, and >5–10 years old respectively .

Data collection:

Previously, a questionnaire paper was maintained and submitted to each patient, which state his age, sex, residence, signs and symptoms, administered medications and other complaints if presents.

Specimens collection:

After cleaning the external auditory canal (EAC) from cerumen, pus, wax and other odorous ear discharge, with a sterile cotton swab moistened by 70% ethanol, ear swabs from all patients were collected and sent to parasitic examinations (WHO**,** 1997) .

Examinations

1-Parasitic examination:

All of the children whom suspected with aural myiasis ,in the field of present study, were investigated to show the parasitic organism in their ears cavities .The ears swaps samples of eggs, larvae, or adult flies were collected and handled with all appropriate precautions .In the collection of samples , a combination of suctioning and forceps was used to remove parasitic organism(especially larvae and adult flies)under the light microscopic field .Then the collected samples were placed in 70% ethanol and transported to the parasitic laboratory . Formalin should not be used in such cases.

2- Physical and otological examination:

They were revealed unilateral and bilateral ear discharges, redness of the pinna, odorous ear discharges, mature and larval stages of fly. Furthermore, with the aid of CT scan "in some cases" and x-ray. It was revealed that many patients were had persistent ear discharge, with perforation of ear tympanic membrane and sclerotic mastoid**.**

3-Pathological examination:

It was revealed that the pathogenicity and defect in the middle ear cleft involve the perforations of tympanic membrane; obstruction and some ossicular chain erosion; formation of granulation tissue, polyps formation and cellular mastoid with sclerosed. Beside that, many cases appear to be irritant.

4- Surgical examinations:

By the aid of surgical microscope and under general anesthesia prior to surgical intervention, patients selected for suction clearance were those who had aural polyps for remove and deciding the origin of pathology and those who had sclerosed and granulation tissues. In the note of worth, the application of local and systemic recommended antibiotics was done for all patients before surgical intervention, and most of patients when follow-up conservative and/with surgical intervention during six months, seemed good and healthy.

Results:

The obtained results were analyzed and depicted in the following tables:

Table-1: showed the percentage rate of myiasis among all csom patients according to age groups. The first age 1 – 3 years old was represented high percentage of myiasis infestation (46%). The-overall myiasis infestation was (77%) among the thirteen csom studied patients.

Table-2: showed the distribution of infection according to patient's sexes and residences. There is 77% of patients were lived in rural area. There are54% and 46% of patients were males and females respectively.

Table-3: represented the pathological finding that associated with infested-csom patients. Since, all patients were had perforation of ear tympanic membrane (100%), granulated tissue (46%) and polyps formation in (31%) respectively.

Table-4: showed the applicated lines of management. Hence, there are three patients were cured conservatively and eight patients were cured by suction clearance with/and surgical intervention (23%) and (62%) respectively. The overall curence was (85%).

Table-1: The distribution of aural- myiasis among all csom- patients according to age group.

Age -group(in years)	No. of csom-patients	%	No. of myiasis-infested csom patients	%
1 – 3	6	46	6	46
>3 – 5	4	31	3	23
>5 – 10	3	23	1	7.7
Total	13	100%	10	77%

Table-2: Distribution of infection among all csom- patients according to sex and residence.

Age-group	No. of csom - patients	Residence				Gender			
		Rural	%	Urban	%	Males	%	Females	%
1 – 3	6	6	46	0	0	3	23	3	23
>3 – 5	4	2	15.4	2	15.4	3	23	1	7.6
>5 – 10	3	2	15.4	1	7.6	1	7.6	2	15.4
Total	13	10	77	3	23	7	54	6	46

Table-3: Distribution of pathological findings among all infested csom- patients.

Age - group	No, of csom - patients	Pathological findings					
		Perforation	%	Polyps	%	Granulation tissue	%
1 – 3	6	6	46	1	7.6	1	7.6
>3 – 5	4	4	31	1	7.6	2	15.4
>5 - 10	3	3	23	2	15.4	3	23
Total	13	13	100	4	31	6	46

Table-4: Line of management to overall csom myiasis- infested patients.

Type of management	No. of managed patients	%	*Currency finding
Conservative	3	23	85%
Suction clearance/surgical intervention	8	62	
Total	11	85	

* All csom myiasis- infested patients were underwent local suction and/with surgical intervention , beside that a topical and systemic recommended antibiotics were formulated and administered to each disease case for six months. Eventually, highest percentage of them were on follow up and appeared good. In addition, there are tow subject of csom-enpatients in the field of present study were left the hospital and discontinued their medications course for unknown reason(their own decision)!!.

Discussion:

Our finding lines according to:
1- Parasitic organisms causing aural myiasis:

In the world wide, there are three species of flies are identified to infest human and causing myiasis, these are as follow:
a-*Chrysomyia bezziana* of southern Asia and south Africa .
b-*Phaenicia sericata* of eastern Europe (known as surgical maggot).
c-American screw worm fly (old world screw worm)

The distribution of new and oldword screw worm flies of aural myiasis is a cosmopolitan, since the new world screw worm detected in Libya in 1988,but have since been eradicated .The old world screw worm ,*Chrysomyia bezziana* ,can be found in southeast Asia ,Indian tropical and sub-saharan Africa and some countries in the middle East .

Also, it has been recorded in Kuwait till 1988 . Infestation of aural myiasis have recently occurred in Iraq and Iran (Nassir,2001; Abu-Alhab,1984; Lee and Yong,2008; Spradbery,2008; Bosworth and Marshen ,1984; Koksal *et al*,2005 ; and Singh *et al* ,1993).

In relation to main criteria (fly color, type of mouth parts , spiracles and segment , etc.) of the identified fly of aural myiasis in our present study ,and according to the above mentioned studies, the fly that caused infestation in our present study was belonging to the family Calliphoridae (blow flies or blue bottles) and to other generation of screw worm of American species.

The explanation for such finding may be attributed to the following reasons :- About 3–10% of travelers may experience ENT diseases. In a world where international business travel and vocation may take anyone anywhere within a few hours, since aural myiasis-infested patients with painful ear diseases may be knocking on your door ….so get ready !!.So that the above explanation is to remind you of clinical presentation of the most common imported parasitic diseases .But hopefully for parasitic researchers and ear doctors , the laboratory and ear apparatuses should be frequently involved in such cases.

2- Ages:

Our findings showed high prevalence of myiasis infestation among patients with chronic suppurative otitis media (100%) which was (77%), especially in the first age group 1 – 3 years old (46%), as shown in table-1. studies were mentioned high prevalence of myiasis among childhood individuals especially with those who had csom (Köksal *et al*, 2005 ; Jacobson *et al*, 1980 ; Nassir ,2001 ; Jains *et al*, 2008). The explanation for such result may be due to high vulnerability with sensitivity of children to infestation of myiasis than the adult individuals (Tains *et al*, 2008 ; Nassir,2001). Also, the low educational health level with poor sanitation and awareness especially in rural regions can cause increasing infestation of aural myiasis (Köksal *et al*, 2005 ; Nassir ,2001). In addition, the presence of odorous flesh tissue in the middle ear cleft of unawareness csom-children can cause attraction to the fly female to such site (Gopalakrishnan *et al*, 1998; Nassir,2001 ; Wall and Smith, 1997).

3- Sex and residence:

Constantly, both sexes of human kind (males and females) can be infested and considered as a myiasis targeted hosts. Studies were mentioned that both sexes of human are with the same chance of aural myiasis (Köksal *et al*, 2005 ; Nassir, 2001). Our findings were in inconflicting with the results of these studies. Since, infested males were (54%) whereas infested females were (46%) respectively, as shown in table-2.

In relation to patient's residences, our study revealed high percentage rate of aural myiasis was occurred among csom-patients whom were lived in rural area (77%), more than those in urban area (23%) respectively as shown in table-2. Our study in agreement with other studies (Smith and Wall ,1998; Gopalakrishnan *et al*, 1998; Hall and Wall ,1995) .The explanation for such occurrence can be attributed to the following reasons; low personal hygienic level; poor sanitation, dealing with/or contact with animals (reservoir), suitable niche to female fly in rural region, poor attendance to hospital and its doctors; bad personal behavior (lay and sleep on ground) and etc.

4- Pathological findings:

Our study revealed the following pathological effects in the middle ear cleft among all infested children, these are: perforation of ear tympanic membrane (100%), polyps formation (31%), and granulation tissue in (46%) respectively as shown in table-3. several studies and researchers were had mentioned these middle ear effects in the world wide, especially, among myiasis-infested individuals (Köksal *et al*, 2005 ; Hall and Wal ,1995 ; Nassir ,2001; Jains *et al* ,2008). In fact, the ear tympanic membrane is considered and regarded as the first targeted part in the middle ear orifice to be influenced and effected by infestation of aural myiasis (Köksal *et al*, 2005 ; Nassir. ,2001 ; Jains *et al*, 2008). In the note of worth, the sensitivity response in the middle ear tissue can be appeared in a different and several aspects such as; polyps formation, granulation and sclerotic tissue, and mastoid and etc (Gopalakrishnan *et al*, 2008 ; Geary *et al*, 1999 ;Giebink,1992 ; AL-Agilly ,2000 ; Lee and Yong,2008).

5- Line of managements:

All patients in the field of present study were underwent both conservative and surgical intervention respectively. Eventually, all of them were had been on regular follow-up. Period of six months had been occupied for each case of aural myiasis. Our findings were confirmed that three patients were cured conservatively (23%) and eight patients (62%) were cured by the aid of surgical intervention respectively as shown in table-4. many studies were used similar management lines for such situation (Köksal *et al*, 2005 ; Giebink ,1992; Lee and Yong,2008; Greenberg ,1984; AL-Agilly ,2000 ; Nassir ,2001).

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