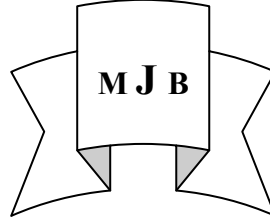


Oestrus ovis Human Ophthalmomyiasis in Iraq

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Abstract

Introduction: I am presenting my clinical experience of human infestation by *Oestrus ovis* ophthalmomyiasis externa in detail, as far as the records I am keeping of the cases permit me.

Patients and Methods: Those are patients who came under my care in military and civil service at the place of work in 4 mid and southern Iraqi provinces. I used slit lamp biomicroscope, but sometimes just a head-mounted binocular loup for diagnosis. I treated all cases.

Results: The total number was 204 cases, The mean age of highest incidence was 12.32 SD 6.5 years. The highest seasonal incidence was on May every year. The mean larval count was 5.36 SD 4.24.

Conclusion: The standard clinical picture is that of a young boy with a history of being near to sheep or countryside or in open air and was hit on the eye by a foreign body or an insect. Ideally within a few hours he suddenly develops a feeling of foreign body, redness, swelling, tearing and photophobia. On examination, you see excessive mucus, pale diffuse conjunctival swelling and hyperaemia, subconjunctival haemorrhage, may be chemosis and curds of yellow mucopurulent floccules. This is almost invariably unilateral. Usually it is possible to find at least one larva (a spindle shaped cylindrical transparently white actively moving worm of about 1-5 mm length and black oral hooks connected to a white cephalopharyngeal skeleton).

أصابة سطح عين الإنسان ببرقة ذبابة النغف الأنفي للمواشي في العراق

الخلاصة

أقدم خبرتي السريرية في موضوع إصابة سطح عين الإنسان ببرقة ذبابة النغف الأنفي للمواشي بالتفصيل الذي سمح لي به تسجيلي للمصابين ممن راجعوني.

المرضى والطرق: مرضى عالجتهم في خدمتي العسكرية و المدنية في مكان عملي في ٤ محافظات عراقية أثنتان وسطى و اثنتان جنوبية . أستعملت في الغالب مجهر المصباح الشقي و لكن أحياناً العدسة المكبرة الثنائية للتشخيص و عالجت جميع الحالات.

النتائج: العدد الأجمالي كان ٢٠٤ حالة .معدل العمر كان ١٢,٣٢ أنحراف قياسي ٦,٥ سنة .أعلى نسبة حدوث كانت في مايس كل عام ومعدل عدد البرقات كان ٥,٣٦ أنحراف قياسي ٤,٢٤ برقة.

الأستنتاج: الصورة السريرية القياسية هي: صبي يافع قرب أغنام أو مناطق ريفية أو مفتوحة فيصدم عينه جسم غريب أو حشرة . مثالياً في غضون عدة ساعات ينشأ لديه شعور بجسم غريب ،أحمرار ، تورم ، تدميع ورهاب الضوء في العين المصابة. عند الفحص نشاهد تدميع كثير، مخاط ، تورم عام شاحب في المنضمة مع أحمرار و نزف تحت المنضمة ، هناك كتل من إفرازات ثخينة مخاطية قيحية متجنبة ، يقع هذا كله حصرياً في عين واحدة دائماً. عادة ما نجد على الأقل برقة واحدة ، و هي دودة صغيرة الحجم لها حركة دودية سريعة ، تختبئ من الضوء، في إحدى نهايتها مقلبان سوداوان يتصلان داخل جسمها الشفاف بهيكل رأسي بلعومي طولاني أبيض اللون ذي شعبتين.

Introduction

I remember the first time I came across a case of *Oestrus ovis* ophthalmomyiasis externa. It was

on June 16th 1984 in Umarah Military Casualty Hospital. Being astounded by the finding, I kept a record of the case and the succeeding 11 cases on

May 1985. Samples of the collected larvae were sent to a local governmental parasitologist and were recognized to be first instar larvae of *Oestrus ovis*, Class Insecta, Order Diptera, Family Oestridae, the sheep botfly. I kept a record of most of the similar cases I saw later on which were 2 from Baghdad, 113 from Samawah and 77 from Hillah up to the 31st of December 2006. Today I feel authorized to establish a fairly constant clinical picture of the condition, that of the kind which made me 100% sure of the diagnosis in the 4 cases where I could not find larvae. This is exactly the aim of this study.

Results

Patients and Methods

The patients were those attending to Ophthalmic Consultation Department in Umarah Military Casualty Hospital, Ibn Alhaitham Ophthalmic Teaching Hospital, Samawah Teaching Hospital & Alhillah General Teaching Hospital, directly or referred from other health centers. I should add to that those patients who were diagnosed at my private clinics in Samawah and Hillah. The slit lamp biomicroscope, the specialist direct ophthalmoscope and sometimes a binocular loupe and a projector light were the instruments used.

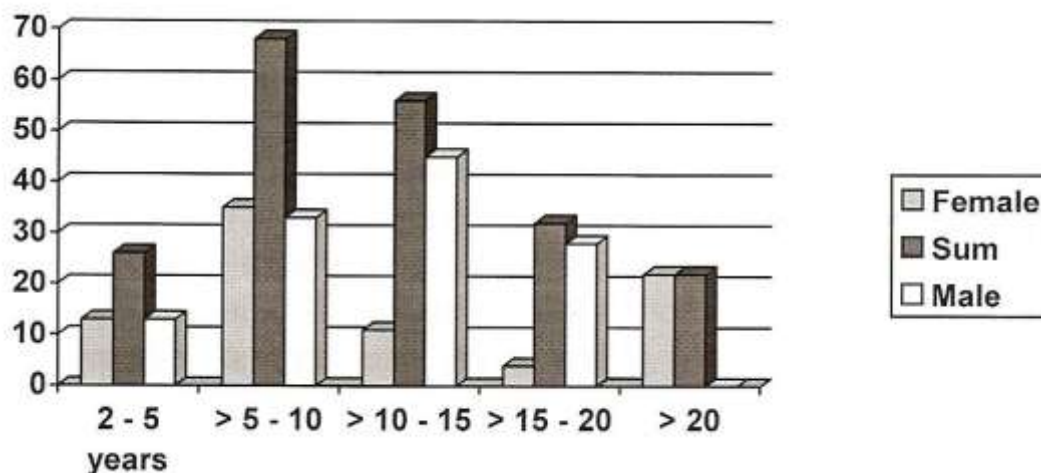


Figure 1 The age and sex incidence. Mean age is 12.32 SD 6.5 years.

Male: Female ratio is 9:4. Peak overall incidence and peak female incidence is at age group > 5-10 years; while the peak male incidence was at age group > 10-15 years. The least male incidence was at age group 2-5 years, least overall and female incidence was at age group >20-37 years.

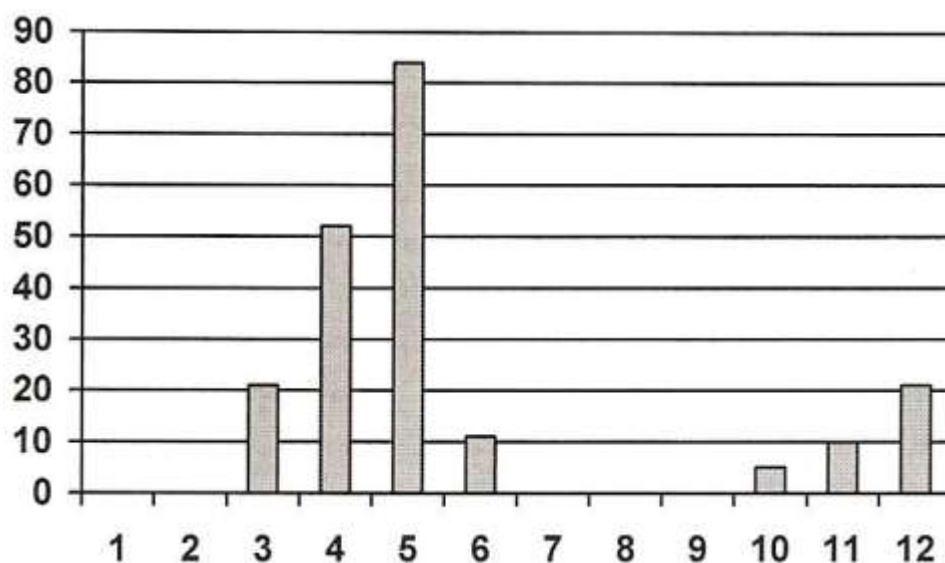


Figure 2 Shows the seasonal variation.

Cases start to appear in March, more than double in April, and peak in May, followed by a sudden fall in June to half the cases of March. Another appearance that starts in October with half June cases, double in November and peak in December; this peak is

only 1/4th of that of May. So you can see that January, February, July, August, and September were exempted.

Now we come to the details of the clinical picture:

Table 1

	A	B	C	D	Sum
No.	148	41	12	3	204
%	72.5	20.0	6	1.5	100%

Table 1 shows the presentations which detail as follows:

Group A: Usually a shepherd or a person in close contact with sheep with or without a history of being hit by a flying foreign body or an insect suddenly starts complaining of foreign body sensation, tearing, redness, swelling Table 1 shows the presentations which detail as follows: discharge. Group B: An adult with no history of close contact with sheep, or sometimes even of urban residence, mostly comes with a history of being hit by a flying foreign body or an

insect, followed a few hours later by the sequence of the symptoms mentioned above in group A. The thing that is present in all cases of this group is their outdoor presence; in the open air.

Group C: Patients or their close relatives recover the larvae from their eyes.

Group D: In this group there is nothing specific in the history, Table 1 shows the presentations which detail as follows: you diagnose them just because while you were examining

them you come across a typical live larva.

The table shows that group A are 72.5%, group B 20%, group C 6%,

Table 1 shows the presentations which detail as follows: group D 1.5% of the presentations.

Table 2 Watery discharge was present in all cases, mucus discharge in 166 cases (81.4%) and liquid mucopurulent discharge was present in 38 (18.6%) of the cases. A characteristic form of discharge was like curdled flocculi of mucopurulent material extending between opposed conjunctival surfaces, or on the same surface. Such a discharge was present in a little more than half of the cases.

	Watery	Mucous	Mucopus	Flocculated
No.	204	166	38	105

Table 3 Oedema of the pale, diffuse (translucent) type in the vast majority, chemosis was present in nearly 60% while periorbital oedema was present in around 30%.

Type	Diffuse	Chemosis	Periorbital
No.	201	122	62

Table 4 Subconjunctival haemorrhage was in all cases; 87% microscopical & only 13% macroscopical.

Type	Gross	Microscopical
No.	26	178

Table 5: A characteristic, almost pathognomonic, mucous pseudomembrane was covering the upper palpebral conjunctiva in 131 cases, and when I peel it, it takes out with it any entangled larva, and the conjunctiva under it does not bleed further. 7 cases show an extension of a more firmly adherent mucopurulent pseudomembrane that mimics other severe cases of conjunctivitis.

Type	Mucous	Mucopurulent
No.	131	7

Finally we come to the collected larvae:

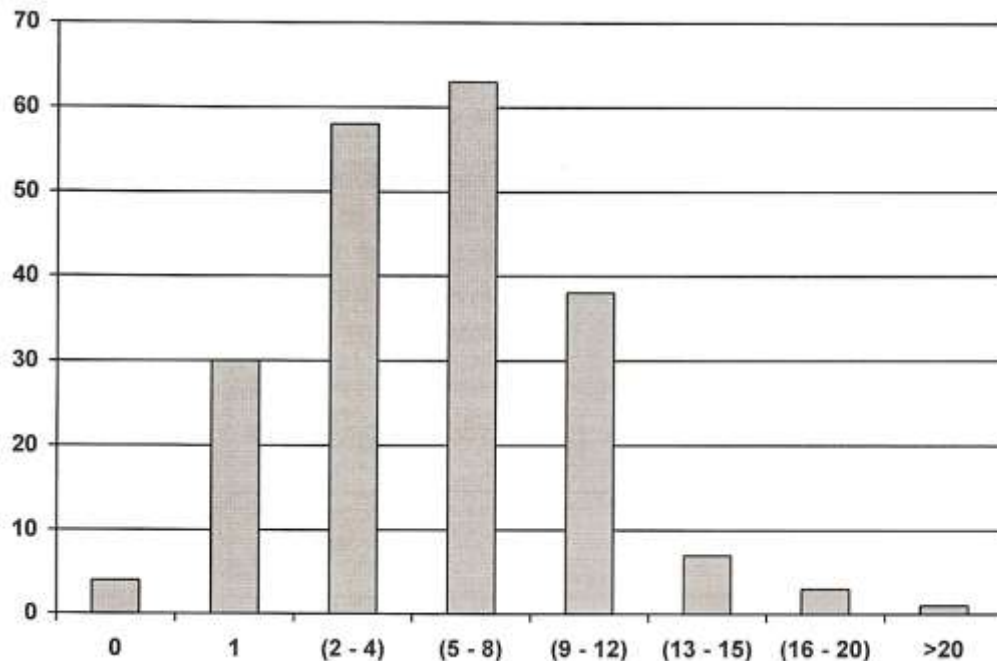


Figure 3 The larval count incidence, and it shows that the highest incidence was that of the 5-8 larva group and the least incidence was that of the >20 larva group.

Discussion

Myiasis is the parasitic infestation of vertebrate animals by the larva of Dipteran flies of Class Insecta. This can cause massive destruction accompanied by marked inflammatory reactions and secondary bacterial infection. The larva of *Oestrus ovis* is an agent of sinusal myiasis of sheep and goats which may accidentally infect humans[1]. The most common site of infection is skin wound. Less common sites are eyes, nose, paranasal sinuses, throat and urogenital tract[2]. Ocular involvement is responsible for 5% of all cases of Myiasis and is denominated Ophthalmomyiasis[3]. In a review of the literature 393 cases of facial myiasis were found, 274 of them were ophthalmic, 78 pharyngeal, 40 nasal and 1 aural[4].

Keyt was the first to describe a case of ophthalmomyiasis in 1900[3]. However the second case report by James did not appear till 1947[5]. More scattered cases have been

reported since then from the Mediterranean area, Russia, Serbia, India, Africa, America and Oman[2].

Now it is well established that ocular myiasis can occur in most regions of the world, particularly in underdeveloped and rural areas where livestock are prevalent. It is most common in the Middle east, Africa and Central America[6]. It is endemic in South Europe [7,8,9], China [10], Russia [11], India [12], Australia [13,14], Hawaii[15] and Catalina Island[16]. It is sporadic in South U.S.A[17], Mid Europe [18-22], U.K[23], South Africa[24,25], New Zealand [26], and the Carribean [27].

In Iraq, by 1980, there were 2 reported cases[28]. Another case was reported in a military personell among the American troops in 2004 in Northern Iraq [29]. I once attended a case-presentation at a conference in Samawah in 1990(unreported). On preparing this study, a colleague ENT surgeon told me that he counted

(many) nasal and aural cases of *Oestrus ovis* myiasis without caring to report them. A report of case series from Libya was the only one to give an estimate of annual incidence of 10:100,000 for it[30].

The life cycle of the insect consists of 2 phases[4], the parasitic one starts when the gravid adult female swarms around the heads of animals and ejects the first instar larvae which have previously hatched from the eggs in the fly vagina in a stream of milky fluid onto the nostrils of the host[22]. Direct contact between the fly and host is not necessary[31]. The larvae mature in the mucous membrane of the nasal cavities and depending on the season and climate this stage may take about few weeks to some months. The third instar larva is ultimately sneezed onto the soil where the free living phase starts by pupation. After a complete metamorphosis (3-6 weeks) the pupa changes into an adult fly that lives for about a month [17]. The adult fly is yellowish-greyish brown to black in colour, of about 1-1.5 cm in length, bigger than a house fly, but smaller than a bee [17,22]. It sometimes accidentally deposits first instar larvae in the eyes, external auditory canal, lips and nose of man[4]. They are mostly confined to the outer membranes of the eye[32]. Some reports indicate that the first instar larva may mature in man up to the third instar stage [1,4,33,34].

The insect is ubiquitous, but most common in shepherding areas and outdoors in the open air[22]. This explains absence of cases below 2 years of age (infants and toddlers are usually kept indoors at the farms). Very old people are less ambulatory and therefore at a distance from livestock.

The more male to female ratio (noticed by most of studies) is partly artificial (some studies involve essentially only males, as those done on military

personell) and partly social, due to the expected higher ratio of getting close to livestock and higher ratio of consulting among the affected on the male side. As you can see there are more females from the age group (>5-10).

Regarding seasonal variation, I think it can be explained by the life cycle, though I think that the small size of the second peak is partially exaggerated due to paucity of referral for notification in the cold rainy seasons. A nearly similar 2 peak seasonal incidence was found by a study in Kuwait [35], a second one in Jordan[36], approved by a third from Pakistan [3] and confirmed by a fourth from India [12].

Now; The clinical presentations:

Regarding laterality, all of my cases were unilateral. In the literature there are only 2 bilateral cases[16,17]. Contrary to the vast majority of the literature, 72.5% of my cases were of group A presentation, and only 20% were of group B. This is the expected in an endemic area. Presentation C is scarcely mentioned, while presentation D is not mentioned in the literature. I think that group A is artificially reduced specially in winter.

The discharge is actually 100% mucous, and the tint of pus in the 38 cases was due to secondary infection in late presented cases. The presence of the characteristic curdled flocculi in more than half of the cases makes it a valuable clinical sign in the diagnosis.

In the issue of oedema, there is this characteristic pale diffuse type, which is most prevalent. Chemosis and periorbital oedema are definitely superimposed in more severe cases.

Regarding the pseudomembrane, the mucus one has a high predictive value as a useful sign in diagnosis, since it has a somewhat high occurrence (64%). Mucopurulent pseudomembranes were

obviously due to very delayed, severely superinfected cases.

Concerning subconjunctival haemorrhage, it should be due to the mouth claws that the larvae protrude to anchor themselves to the conjunctiva, which cause the famous sight of a larva being picked up by a forceps in its middle remains attached by its claws to the conjunctiva resisting to let go.

The larvae that I collected are 1-5 mm long, 0.5-0.8 mm wide, translucently white to yellow in colour, spindle shaped with 2 tapered ends. The mouth end contains the elongated twinned black claws attached to a white cephalopharyngeal skeleton. They are active with quick vermiform movement. They are photophobic, shying away from light. I think this is because of their translucency. Strong light can, probably, hurt their delicate, inside structure. This may be the reason why adult female larviloading insect prefers to eject larvae into holes leading into dark channels and sinuses. Third instar larvae, on the other hand, have some dark brown pigment on their dorsal surface (I), since they need to develop in the soil, while the adult fly is totally grey-brown to black, that is why, probably, it prefers to larviposit in hot, shiny middays [37].

For larval counts, I came across references mentioning huge numbers (60,50,30)[16,17,38] that I did not actually meet. I diagnosed 4 cases lately, depending on history and clinical examination only without finding any larva. The only difficulty is when such cases come in the middle of an outbreak of viral haemorrhagic conjunctivitis when they are going to be lost.

Treatment: Removal of all discovered larvae using a blunt tipped forceps under topical anaesthesia and this includes careful search in all fornices aided by peeling any pseudomembrane. I used topical

antibiotics in secondarily infected cases.

I made sure that every single case received enough reassurance of the simplicity and benignity of the condition, and some health education regarding the source of it.

Conclusion

According to this study, the clinical picture of Oestrus ovis ophthalmomyiasis externa in Man is complete and the typical case would be as follows:

A male, 5-10 years of age, a shepherd with a history of being hit in the eye by an insect and develop few hours later, fairly suddenly, crawling foreign body sensation and redness, oedema and watering. On examination you see diffuse, pale conjunctival oedema, chemosis, mucous pseudomembrane, curdled floccules of thick mucus, subconjunctival haemorrhage and finally, the larvae which have a peculiar shape: small, white-yellow, translucent, cylindrical, with both ends tapered. Mouth claws are black, connected to a white cephalopharyngeal skeleton, with active vermiform movement.

N.B.:

Due to the astounding spectacular nature of the condition, it is sometimes surrounded by superstitions and phobias. A 35 years old male came months after I treated him to tell me that worms kept getting out of his eye since then. When I investigated him, I discovered that he turned to develop a mucus fishing syndrome due to the psychological impact.

References

- 1- Sarjo Bapna, Sweta Kothari, S. Raju, H.Y Palampa Deshpande, L.S. Patil and Ranjana A. Deshmukh, (2006), " A rare case of nasal myiasis due to Oestrus ovis identified in man.

- "Haffkine Institute for Training, Research and Testing (online).
- 2- Mohsen Masoodi, Keramatalah Hosseini, (2004),"External ophthalmomyiasis caused by sheep botfly (*Oestrus ovis*) larva: A report of 8 cases." *Archives of Iranian Medicine*, Vol.7 NO.2: 136- 139.
- 3- Azam Ali, Agha Hassan Feroze, Paul FelTar, Asad Abbas, Mohammad Asim Beg, (2006)," First report of ophthalmomyiasis in Pakistan." *Journal of Pakistan Medical Association JPMA*, Vol.56, No.2 Feb.(online).
- 4- Ramin Hakimi, Ismail Yazdi, (2002)," Oral mucosa myiasis caused by *Oestrus ovis*." *Archives of Iranian Medicine*, Vol.5, No.3 :July (online).
- 5- Patel S J;(1975)," Ocular myiasis due to the larva of *Oestrus ovis*." *East Afr Med J*; 52: 167-9.
- 6- USACHPPM,(2004)," Ocular myiasis." 18-016-0604, June, on line; available at: <http://chppm-www.Apgen.army.mil/ento>.
- 7-Dono M,Bertonati MR,Poggi R,Teneggi E,Maddalo F,Via F,Orlandi R,Mardi M,Roncelia S, Fedeli F,Battolia E,(2005)," Three cases of ophthalmomyiasis externa by sheep botfly *Oestrus ovis* in Italy." *New Microbiol*, Oct;28(4):365-8
- 8-Mazzeo V,Ercolani D,Tornbetti D,Todeschini R,Gaiba G,(1987),"External ophthalmomyiasis.Report of 4 cases." *Int Ophthalmol*, Dec; 11 (2):73-6.
- 9-Winfield CR,Bargess NR,,(1983),"Oestrus ovis ophthalmomyiasis in Cyprus." *JR Army Med Corps*, Oct;129(3):154-5.
- 10-Jiang Cipeng, (2002), "A collective analysis on 54 cases of human myiasis in China from 1995-2001." *Chin.MedJ*, Vol.115, No.10: 1445-1447
- 11-Iakhontov BV, Ismailov AI, (1978),"Ophthalmomyiasis due to *Oestrus ovis* L parasitization." *Vestn Oftalmol*, Jan-Feb;(1): 82-83.
- 12-Om Prakash, SC Parija, VA Rao, (2004), "External ophthalmomyiasis due to *Oestrus ovis*-a video apropos of a case." *AIOC Proceedings*, External disease (JIPMER) Medical College Pondicherry.Online.
- 13-Freney LC, Fox HC, (1974), "External ophthalmomyiasis caused by *Oestrus ovis* in Queensland." *Med J Aust*, Mar 2;(9):310-1.
- 14-McDermott S, Schafer MD, (1983), "Ophthalmomyiasis due to *Oestrus ovis* in South Australia." *Med J Aust*, Feb 5;1(3):129-30.
- 15-Kajioka EH, Nagao CF, Kara SS, Hardman JM, Navin n, (2004), "Ophthalmomyiasis in Hawaii." *Hawaii Med J*, Mar 63(3):78-9.
- 16-Heyde RRS, Seiff SR, Mucia J, (1986), "Ophthalmomyiasis externa in California." *West J Med* 144: 80-81.
- 17-Ellen Sigauke, Walter E.Beeb, Rita M Gander, Dominick Cavuoti and Paul M. Southern, (2003), "Case report: Ophthalmomyiasis externa in Dallas County, Texas." *Am.J. Trop.Med.Hyg.*, 68(1):46-47.
- 18-Granz W, Schneider D, Schumann H,(1975)," Human myiasis in Central Europe." *Z Gesamte Inn Med*, Apr, 15;30(8):293-301.
- 19-Le Fichoux Y, Marty P, Denis G, Couturier P, Delamonica P (1981)," A case of external ophthalmomyiasis by *Oestrus ovis*, Linne, 1758 caught on the Nice beach." *Acta Trop*, Dec, 38 (4)461-8.
- 20-Prosl H, Meyer J, (2003), "Ophthalmomyiasis caused by *Oestrus ovis* in a 3 year old boy." *Wi en Klin Wochenschr*; 115 Suppl3:76-9.
- 21-Suzzoni-Blatger J., Villeneuve L, Morassin B, Chevalier J.,(2000)," A case of human ophthalmomyiasis by *oestrus ovis* in Toulouse(France)." *J Fr Ophthalmol*, Dec;23(10): 1020-2.
- 22-Verstrynghe K, Foets B, (2004), "External ophthalmomyiasis: A case report." *Bull Soc Belge Optalmol*, 294:67 -71.

- 23-Stevens JD, McCartney AC, Howes R, (1991),"Oestrus ovis ophthalmomyiasis acquired in the U.K.: case report and scanning electron microscope study." Br.J.ophtalmol.Nov.;75(11):702-3.
- 24-Engelbrecht PM, (1982), "Ophthalmomyiasis caused by Oestrus ovis." S Afr Med J, Jan 16:61(3):70.
- 25-Stulting AA, Meyer H, (1981), "External ophthalmomyiasis caused by Oestrus ovis." S Afr Med J, Oct 31 ;60(18):709-10.
- 26-Macdonald PJ, Chan C, Kickson J, Jean-Louis F, Heath A, (1999), "Ophthalmomyiasis and nasal myiasis in New Zealand: A case series. "NZ Med J,Nov 26; 112(11 00):445-7.
- 27-Levett PN, Brooker L, Reifer C, Prussia PR, Eberhard ML, (2004), "Human external ophthalmomyiasis occurring in Barbados." West Indian Med J,Jun;53(3): 198-200.
- 28-Al-Dabagh C, Al-Mufti N, Shafiq M,Rawas AL, Al-Saffar S, (1980)," A second record from Iraq of human myiasis caused by larvae of the sheep botfly Oestrus ovis." Ann trop Med Parasitol; 74:73-7.
- 29-Gregory AR,Schatz S,Laubach H, (2004)," Ophthalmomyiasis caused by the sheep botfly Oestrus ovis in Northern Iraq." Optom Vis sci,Aug;81 (8):586-90.
- 30-Dar MS, Amer BM, Dar FK, Papazatos V,(1980)," Ophthalmomyiasis caused by the sheep nasal bot Oestrus ovis(Oestridae) larvae in the Benghazi area of Eastern Libya." Trans R Soc trop Med Hyg.74(3)303-306.
- 31-Grammer J, Erb C, Kamin G, Wild M,Reidenger C, Kosmidis P.,Pleyer U.,Thiel H.,(1995)," Ophthalmomyiasis externa due to the sheep botfly oestrus ovis(Diptera:Oestridae) in Southwest Germany." Germ J Ophthalmol;4:188-195.
- 32-Fathy FM,El-Barghathy A,El-Ahwal A,El-Baqar S,(2006)," Study on human ophthalmomyiasis externa caused by Oestrus ovis larva in Sirte-Libya: Parasite features, Clinical presentationand management." J Egypt Soc Parasitol, Apr; 36(1):265-82.
- 33-Beristain X,Alkorta M,Egnas,etal,(2001)," Nasopharyngeal myiasis by third stage larvae of Oestrus ovis." Enferm Infec Microbiol Clin;19:86-7.
- 34-Lucientes J, Clavel A, Ferrer-Dufol M, etal. (1997)," Short report: one case of nasal human myiasis caused by third stage instar larvae of Oestrus ovis." Am J Trp Med Hyg.;56:608-9.
- 35-Hira PR,Hall MJR,Hajj B,Al-Ali F,Farooq R,Muzairai IA,(1997)," Human myiasis in Kuwait due to Oestrus ovis,Psychoda species and Megaselia species." MEDICAL PRINCIPLES AND PRACTICE,Jul-Sep(3):129-136.
- 36-Amr ZS,Amr BA,Abo-Shehada MN,,(1993)," Ophthalmomyiasis externa caused by Oestrus ovis L.in the Ajloun area of Northern Jordan." Ann Top Med Parasitol. 87 (3): 25 9- 262.
- 37-Cepeda-Palacios R,Scholl PJ,(2000)," Factors affecting the larvipositional activity of Oestrus ovis gravid females(Diptera:Oestridae)." Vet Parasitol;91 :93105.
- 38- Victor R,Bhargva K,(1998)," Ophthalmomyiasis in Oman; a case report and comments." Wilderness Environ Med;9(1):32-5.