

Orf Infection: A Clinical Study at the Royal Medical Services Hospitals

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ABSTRACT

Objective: To describe the demographics, clinical features, course, therapeutic interventions, and outcomes of patients with Orf infection seen at the Royal Medical Services Hospitals.

Methods: We describe 64 patients with Orf infection who presented to dermatology clinics at different Royal Medical Services Hospitals during a five year period from March 2002 to February 2007. Their clinical presentations, complications and treatment were reported through regular follow-up at weekly intervals.

Results: Sixty four cases (42 males and 22 females) were studied. Their ages ranged from 8-67 years. History of exposure to sheep or lambs was documented in 57 cases (89%). The mean incubation period was seven days (ranged 4-15 days). The incidence peaked after the feast of sacrifice each year. Thirty-six patients (56%) were not aware about the infection before they had been examined by the dermatologist. Misdiagnosis by physicians unacquainted with the disease led to incision of the lesion in 21 patients (33%). The most common sites were fingers, dorsum of hand, and palms. Diagnosis was made by history, appearance and location of the lesion and clinical course. In three cases, histopathological examination was made. The average resolution time of the lesions was 32 days without significant scarring. Complications were reported in 21 patients (33%). In all cases, symptomatic treatment and local wound care were applied. Additionally, systemic antibiotics were used in 13 cases and cryotherapy in 11 cases.

Conclusion: Orf is an endemic infection in Jordan. Although it is a self-limiting disease, prompt diagnosis is of paramount importance in order to alleviate the anxiety of patients because the lesions could resemble other more serious infections, and to avoid inappropriate treatments and possible complications. A national emphasis on the cognizance of the infection, public awareness and preventive measures is highly recommended.

Key words: Ecthyma contagiosum, Orf, Royal Medical Services

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Introduction

Orf, also known as ecthyma contagiosum or contagious pustular dermatitis, is a self-limiting zoonotic skin infection caused by an epitheliotropic deoxyribonucleic acid (DNA) parapoxvirus.⁽¹⁾ It is a worldwide disease but little is known about its prevalence and specific geographical distribution.⁽²⁾ Orf infection is endemic in sheep and goats and transmission to humans usually occurs by direct contact with an infected or recently vaccinated

animal or, less often, indirectly through handling contaminated meat or objects, such as fences, barn doors, feeding troughs, and shears in conjunction with skin trauma.^(3,4)

The infection advances through six clinicopathological stages and usually heals uneventfully in 4-6 weeks. The skin lesions are commonly solitary and typically affect the hands and arms.^(4,5) In humans, lasting immunity is conferred by infection.^(4,6)

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Table I. Summary of study findings

Sex	Males - 42 (66%)	Females - 22 (34%)
Age	Mean - 39 years	Range: 8-67 years
Incubation period	Mean - 7 days	Range: 4-15 days
History of exposure	Yes - 57 (89%)	No - 7 (11%)
Occupation	Farm workers and shepherds (22) Nonprofessional slaughters (11)	Housewives (15) Butchers (9) Not known (7)
Attending physician at first presentation	Dermatology clinics (32) Surgeons (16)	General practitioners (7) Emergency room (3) Orthopedic surgeons (6)
Referral diagnosis in 32 cases	Orf infection in 11 (31%)	Incorrect in 21 (69%)
Patient awareness about infection	Yes - 28 (44%)	No - 36 (56%)
Initial management	Incision /excision in 21 (33%)	Antibiotics in 24 (38%)
Laterality	Right - 43 (67%)	Left - 17 (27%) Bilateral - 4 (6%)
Number of lesions	Solitary - 38 (59%)	More than one - 26 (41%)
Distribution of 108 lesions	Fingers (62) Dorsum of hand (23) Aalm (17)	Forearm (3) Arm (1) Leg (1) Face (1)
Resolution time	Mean - 32 days	Range: 22-54 days
Complications	Yes - 21 (33%)	No - 45 (67%)

Table II. Complications reported by 21 patients out of 64 patients with Orf infection

Complication	Number of patients (%)
Regional lymphadenopathy	12 (18.8)
Lymphangitis	8 (12.5)
Secondary bacterial infection	7 (10.9)
Erythema multiforme	5 (7.8)
Disseminated papulo-vesicular rash	4 (6.3)
Scarring	2 (3.1)
Stiffness of the digit	1 (1.6)

However, some authors claim that immunity to Orf is not permanent as re-infection may occur.^(7,8) Skin lesions are commonly misdiagnosed and patients overtreated. Notably, there is a scarcity of large-scale studies addressing this disease in the literature.

Herein, we report the clinical features and management of 64 patients with Orf infection providing insight into associated complications and recent diagnostic and therapeutic concepts. To the best of our knowledge, this is the first study reflecting the prevalence of this endemic disease in Jordan.

Methods

We describe 64 patients with Orf infection who were seen in different dermatology clinics at Royal Medical Services' Hospitals during a five year period from March 2002 to February 2007. The diagnosis of Orf infection was mostly made by history, appearance and location of the lesion and

clinical course. Histopathological examination was only used to verify the diagnosis in atypical cases. The data were analyzed with regards to patients' sex, age and occupation, the clinical presentation, the diagnoses made by the attending physicians, history of exposure, the incubation period (interval between exposure and appearance of lesions), number and distribution of lesions. Therapeutic modalities used in each case were also noted. Clinical course, including the resolution time of the lesions, and complications were reported through regular follow-up visits at weekly intervals.

Results

Sixty four patients (42 males and 22 females) with Orf infection were studied. Their ages ranged from 8-67 years. Table I details the demographic data and the clinical features seen in the study group. History of exposure was documented in 57 cases (89%). The mean incubation period was seven days (ranged 4-

15 days). The incidence peaked in spring and after the feast of sacrifice each year. The average duration of the disease before the patient sought medical care was 13 days. Only 32 cases attended the dermatology clinics directly, and 36 patients (56%) were not aware about the infection before they had been examined by the dermatologist. Unfortunately, in most cases it was not possible to verify whether the infection was from known infected animals or not. Misdiagnosis by physicians unacquainted with the disease led to incision of the lesion in 21 (33%) patients before referral. One hundred and eight Orf lesions were encountered in 64 cases. The lesions were solitary in 38 cases (59%), they were distributed mostly over upper limbs, and they affected the right side in 43 (67%) cases. Pseudo-koebnerization was observed in three patients. The diagnosis was made by history, appearance and location of the lesion and clinical course. In three cases, histopathological examination was made. The average resolution time of the lesions was 32 days (ranged 22-54 days) without significant scarring. Complications, notably observed in the target and acute stages, were reported in 21 patients (33%) (Table II). In all cases, symptomatic treatment and local wound care were applied. Additionally, systemic antibiotics were used in 13 cases and cryotherapy in 11 patients.

Discussion

Orf infection has been recognized as a common occupational disease among those in contact with infected animals or contaminated meat, such as farmers, butchers and veterinarians.^(1,9) The natural disease in sheep and goats usually occurs in the spring.⁽⁴⁾ It is characterized by proliferative papulo-vesicular lesions of the gums, lips, nose, udder and groin, which usually resolve in 1-2 months.^(2,10,11) Infection transmission to human commonly occurs after trivial trauma. Although rare, human-to-human spread and auto-inoculation may also occur.⁽¹²⁾

Seasonal variation in the incidence of human Orf infection has been previously noted⁽⁷⁾ and was seen in our series. The peak was noted during the spring time. However, Orf is not uncommon among Muslims because many cases are seen after the feast of sacrifice^(12,13) and we observed an epidemic outbreak of human Orf after the feast of sacrifice each year in Jordan.

After an incubation period of 3-8 days, the lesions progress through six clinical pathological stages,

each lasting about one week.^(1,2,4) In the first "maculopapular" stage, an erythematous macule becomes a papule. A lesion with a red centre, a white middle ring and a red periphery characterizes the second "target" stage (Fig. 1). The third "nodular" stage consists of a reddish weeping nodule. A dry lesion with small black dots on the outer surface develops in the fourth "regenerative" stage. In the fifth "papillomatous" stage, papillomas appear on the lesion's surface. A dry, thick crust is the main feature of the last "regressive" stage. Finally, the skin lesion usually resolves within 4-6 weeks with no residual scarring.

History of exposure was documented in 57 cases (89%). The remaining seven patients may have acquired infection by indirect contacts. Most patients (59%) had solitary lesions, and all of them had incubation periods less than 15 days. Men were affected more than women because they are more likely to be in direct contact with farm animals and slaughtering. Most females were housewives and were involved in milking or preparing the contaminated meat (especially during cleaning the animals' heads) before consumption.

Lesions occurred more on the right side and generally on the dominant hand. The hands and arms are the body sites most frequently affected by this virus.⁽⁴⁾ This is consistent with the findings in our sample. With two exceptions, all lesions occurred on the upper extremities in our study. The extensor surface of index and thumb were the most common affected sites. A facial lesion over the right cheek was observed in one patient (Fig. 2). Previously, facial lesions have occasionally been reported.^(2,4,5,14) Additionally, a solitary lesion was observed over the left leg. Interestingly, linear pseudo-koebnerization on the palm and dorsum of hand was observed in three patients overlying inadvertently cut wounds (Fig. 3). These lesions appeared within one week after slaughtering and evolved in the classical stages of Orf infection. This observation mostly represents an auto-inoculation of the virus in this phenomenon.

Fifty-six percent of patients were not aware of the infection before they had been examined by the dermatologist. Three patients presented seeking medical advice for the associated complications but were not aware of the Orf lesion. These observations highlight the lack of public awareness about the infection.

Although Orf infection is a self-limiting disease,



Fig. 1. Two typical Orf lesions in the target stage. The one over the middle finger has been incised by the surgeon



Fig. 3. Linear pseudo-koebnerization in Orf infection overlying cut wound over the palm



Fig. 2. Facial Orf: erythematous weeping nodule, initially mistaken for Spitz nevus



Fig. 4. Solitary Orf lesion over the left little finger complicated by erythema multiforme over the palms and disseminated papulo-vesicular eruption

prompt diagnosis is of paramount importance as it alleviates the anxiety of affected patients and avoids inappropriate treatments and complications. Patients' anxiety results from Orf lesions resembling other life threatening infections such as cutaneous anthrax, tularemia and erysiploid, and the fear of malignancy in such a rapidly growing lesion. Skin lesions were commonly misdiagnosed as pyogenic granulomas and pyogenic infections and patients were overtreated by unacquainted physicians. This led to incision or excision of lesions in 33% of patients before referral. We believe that late presentations and misdiagnoses are likely attributed to the under-recognition of the disease.

The diagnosis is usually clinical, based on the history of contact with infected animals, typical skin lesions and follow up.⁽¹⁵⁾ A biopsy can be done for histopathological examination if the diagnosis is in question. The biopsy is best taken from an early lesion; showing hyperkeratosis and cell vacuolization in the upper epidermis with eosinophilic intracytoplasmic inclusions. However, the histological examination taken from our patients

showed features consistent with those seen in late Orf lesions.

Viral cultures, fluorescent antibody tests, electron microscopy have all contributed to establish the diagnosis, but these are rarely required and restricted to specialized centers.^(2,16) Milker's nodule, a parapox viral infection transmitted from cows, cannot be differentiated from Orf by its clinical appearance or by electron microscopy.⁽¹⁷⁾ Only polymerase chain reaction assay can definitively identify a parapoxvirus as Orf virus,^(11,18) but this is not yet routinely available.

In our study, all patients were immunocompetent. The course of the disease was uneventful in the majority of patients. Additionally, no recurrences have been observed in our patients. The reported complications in our study are summarized in Table II; including erythema multiforme (EM) and disseminated papulo-vesicular rash (Fig. 4).

Noteworthy, the incidence of complications was clinically evident during the second and third stages and was much higher in the group who received surgical intervention. Furthermore, there was a

notable delay of healing of the lesions in patients who developed superimposed infections, EM or in whom the lesion was incised. A review of the literature on human Orf infection yields a diverse array of reported sequelae. Most commonly, fever, lymphangitis, lymphadenopathy, and secondary bacterial infection have been noted.⁽¹⁹⁾ Additionally, there have been some reported cases complicated by EM, bullous pemphigoid, Stevens-Johnson syndrome, widespread maculopapular or blistering eruptions, toxic erythema, and eyelid edema, as well as giant, persistent or recurrent lesions in immunocompromised patients.^(12,17,20-22) Recently, a distinct and unique Orf-induced immunobullous disease has been reported in two cases.⁽¹⁷⁾

Orf is a self limiting viral infection, which usually regresses spontaneously in 6-8 weeks. Therefore, treatment of Orf is usually symptomatic.⁽¹²⁾ Surgery can cause complications and thus must be avoided as a treatment for typical lesions.⁽²³⁾ To date, there is no available specific antiviral treatment and no human vaccine has been produced for the Orf virus. Various treatments have been anecdotally reported; cryosurgery,⁽²⁴⁾ idoxuridine,⁽²⁵⁾ imiquimod,⁽¹²⁾ cidofovir⁽²⁶⁾ and interferon⁽²⁷⁾ have been reported to reduce the time to healing or to clear persistent infection. The use of antibiotics should be restricted to patients with suspected secondary bacterial infection. Cryotherapy is considered beneficial in patients presenting with early infection.

We believe that Orf infection is more common in Jordan than seen in clinical practice. However, because of the benign nature of the disease and familiarity with infection, many individuals, and particularly those involved with sheep rearing, are apt not to seek professional advice. Physicians, especially non-dermatologists, who have not encountered many Orf lesions should be aware of this disease and consider it in the differential diagnosis of hand lesions. Barrier precautions and proper hand hygiene by farmers and butchers and isolation of infected animals are recommended preventive measures.^(1,18)

Conclusion

Orf infection is an endemic self-limiting infection in Jordan. Prompt diagnosis of this disease is of paramount importance to alleviate the anxiety of patients, and to avoid inappropriate treatments and complications. A national emphasis on the

cognizance of the infection, public awareness and prevention measures is highly recommended.

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