Research article

Does Orf (Pacha boil) affect housewives?

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ABSTRACT

Introduction and Aim: Orf is a disease caused by *Parapox* virus. It affects butchers, farmers, shepherds, and veterinarians. Orf progresses through six clinical stages. In some Arab countries, housewives purchase sheep's head and trotters for cooking Pacha dishes. This study was aimed to learn the clinical presentations and complications of Orf disease and to identify the relationship with various occupations.

Methods: This case-control study including 70 patients with Orf disease, and 80 control individuals was carried out in Anbar, Iraq, from August 2018 until April 2020. History and clinical findings were reported for patients like age, gender, residence, onset of disease, and its relation to the season, time, or Eid occasion. Concurrent small trauma when handling Pacha with or without hand protection equipment was noted.

Results: The mean age was 39.8±8.9 years, 20% were males, and 80% females. Mean duration of disease was 14.7±7.8 days. Orf disease was highly significant in housewives than in butchers (p-value<0.01). About three-quarters of patients had preceding mild trauma by broken sheep's head and trotters. No hand protection was used in 77.1%. Two thirds of patients acquired disease after Eid events. Orf involved only hands. Furthermore, 37.1% of cases had a targetoid stage. The disease was significantly reported in summer and autumn. Self-healing occurred within six weeks. Cellulitis (12.6%) and paronychia (4.2%) were described as new complications.

Conclusion: After Eid events, Pacha boil (Orf) affected housewives who had unprofessional handling of Pacha without protective measures. Targetoid stage was common. Early diagnosis is mandatory to avoid complications.

Keywords: Orf; *Parapox* virus; Pacha boil; Housewives; Eid.

INTRODUCTION

Orf is a self-limiting zoonotic skin infection caused by *Parapox* virus. Orf virus (OrfV) belongs to the family of DNA *Poxviridae*. Infection of sheep or/ and goats leads to a disease commonly known as ecthyma contagiosum, contagious pustular dermatitis, sore mouth, or scabby mouth. According to the Oxford English Dictionary, the word Orf is derived from Old Norse *hrufa*, which means crust on a wound. Typically, animal's Orf lesions are found in the mouth, nostrils, mucosal area of the lips, eyes and may occur on the udder and teats (1, 2).

In humans, Orf infection was first defined by Walley in 1890. However, a more accurate clinical description of the infection was reported by Newson and Cross in 1934 (3, 4). Orf disease affects butchers, farmers, shepherds, veterinarians, and meat industry employees. Orf leads to singular lesions that are mainly seen on the fingers, dorsum of the hands, wrists, and arms. Face, tongue, nostrils, eyelids, and perianal region can rarely be infected (5, 6). Orf infections appear after specific Muslim holidays like Eid al-Adha and Eid-ul-fitr, where sheep and goats are frequently sacrificed (7, 8).

In humans, the incubation period of the virus is between 3-14 days. The lesion is typically 2-3 cm in diameter, but it may reach 5 cm. Orf progresses through six clinical stages, and each last one week (9)

1. Maculopapular stage, an erythematous papule emerges.
2. Targetoid stage lesion appears as a target-like nodule, red at the center, white in the surrounding ring, and bordered by erythema.
3. In acute stage the lesion matures and enlarges with more exudation.
4. Regeneration period - lesion develops black dots and forms a thin crust.
5. Papillomatous stage - at this phase, very small papillomas grow.
6. At regressive stage, a dense crust, develops on a flat lesion and heals rapidly.

The diagnosis depends on history obtained from the patient about viral source exposure as well as clinical examination of lesions. (10) Histopathology varies according to stage. In epidermis, parakeratosis, irregular acanthosis, and hyperkeratosis with ballooning degeneration, cytoplasmic vacuolization, and viral inclusions. In the dermis, increased vascularization with a dense lymphohistiocytic

infiltrate, neutrophilic and eosinophilic is seen (11, 12).

The differential diagnosis of Orf includes milker's nodule, fish tank granuloma, pyogenic granuloma, keratoacanthoma, fungal infection, and cutaneous anthrax. (1) In our society, Pacha is a traditional Iraqi dish made from sheep's head and trotters that are cleaned and boiled slowly and served with bread sunken in the broth. The dish is also known as *kawari*. Women purchase Pacha (sheep's head and trotters) from local butchers approximately twice a year to cook Pacha dishes.

Orf is a self-limited disease. It requires symptomatic management with moist dressings and local antiseptics. Secondary bacterial infections must be treated with topical or systemic antibiotics. Several case reports describe Orf successfully cured with topical imiquimod, resulting in rapid regression of the lesions (13).

The current study aimed to elucidate the clinical presentation of Orf disease, which can be called Pacha boil. Additional aims were to identify Orf related complications as well as their relationship with various occupations.

MATERIALS AND METHODS

This case-control study included 70 patients (14 males and 56 females) with Orf disease. It was carried out in the Department of Dermatology and Venereology at Al-Ramadi Teaching Hospital and Private Dermatological Clinic, Ramadi City, Anbar Governorate, Iraq between August 2018 and April 2020.

A full history was taken from all participants, including age, gender, residence, drug intake, particularly immunosuppressive agents, past medical conditions like diabetes mellitus, and connective tissue diseases. The onset of Orf disease and its relation to the season or Eid occasions. Whether keeping household animals or not was noted. Time interval between the appearance of Orf symptoms after handling and/or cleaning Pacha (sheep's head and trotters), use of gloves and detergents and reports of concurrent trauma in the hands during preparation of Pacha was noted.

Medical examination included site, size, number of lesions, clinical stage of Orf disease, associated symptoms, and complications. Whether the lesions appeared at the same time or one after the other was noted. Follow up was done every 20 days until it healed with or without leaving a scar. The diagnosis of Orf disease usually depends on history and clinical examination. It is uncommon to do laboratory tests. Complete blood count, glycemic state, and HIV Ab-Ag test were done. For challenging lesions, an incisional biopsy was sent for histopathological study to prove the diagnosis. Eighty control individuals were involved in this study, 20 healthy butchers, and 60 housewife patients who consulted Dermatology Outpatient Clinic for Orf unrelated skin problems like melasma, hair loss, and urticaria.

Ethical considerations

This study was approved by the Ethical Committee at the College of Medicine, University of Anbar (*Ref. No 47/12-8-2020*), and written consent was obtained from each patient before enrollment in the study, and digital photographs were taken. As Orf disease is self-limiting, patients were treated according to their symptoms and complications.

Statistical analysis

The data were analyzed using Microsoft Excel 2010 and SPSS version 22. The hypothesis was tested using Chi-square tests and t-test. A p-value < 0.05 was considered to represent a significant difference.

RESULTS

A total of 70 patients were recruited. Their mean (± SD) age was 39.8±8.9 years (range 25-60 years); 14 (20%) were males, and 56 (80%) were females and the male to female ratio was 1: 4. All patients neither had household animals nor family or personal history of the same condition. There were no significant differences in their residency, with 33 (47.1%) living in urban areas, and 34 (48.6%) in rural areas. Mean (± SD) incubation period after handling animal products (carcass) was 6.5±1.33 days (range 3-9 days). The mean (± SD) duration of the disease was 14.7±7.8 days (range 6-34 days) (Table 1).

Table 1: The ranges and means of multinomial logistic factors affecting the patients with Orf disease

	N	Minimum	Maximum	Mean	Std. Deviation
Number of Orf lesions	70	1	4	1.3	0.7
Age (years)	70	25	60	39.8	8.9
Onset after handling animals' products-carcass incubation period per days	70	3	9	6.5	1.3
Duration of illness –days	70	6	34	14.7	7.8
Size of lesion (mm)	70	4	50.0	14.2	11.0
Healing times (weeks)	70	4	7	5.8	0.7
Associated Symptoms and complications seen in Orf (days)	70	1	24	8.1	6.5

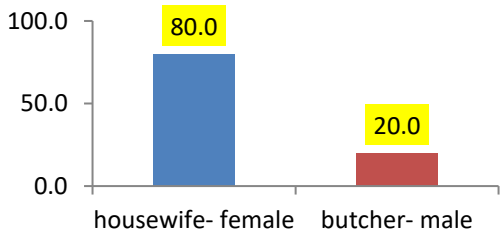

Fig. 1: The frequency (percent) of occupation and gender, *P* value< 0.05

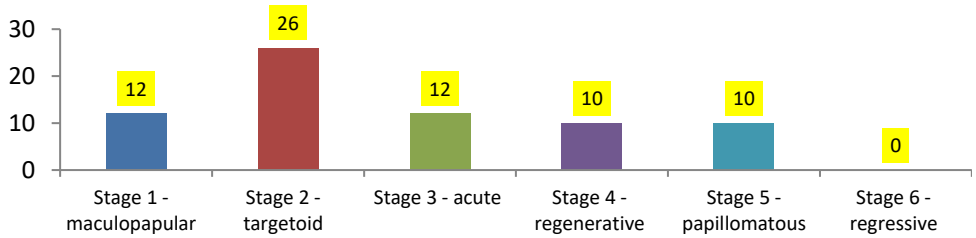

Fig. 2: Frequency of patients according to clinical stages of Orf, P value <0.05

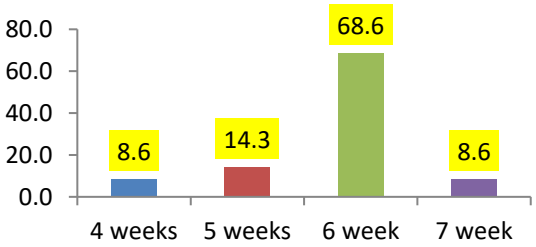

Fig. 3: Weeks needed for self-healing of Orf disease, P value <0.05

Orf disease was found significantly high in housewives 56 (80%) of cases, and in butchers 14 (20%), *p* value<0.01 (Fig. 1).

Depending on history, 14 (20%) patients had multiple lesions at the time of presentation with similar clinical stage, 54 (77.1%) had preceding mild trauma at the site of Orf lesion during holding a carcass in the left hand and broke it in the right hand using the axe. In 46 (65.7%) patients acquired Orf disease after Eid event over time. Lesions did not leave any scar in 60 (85.7%) cases. Protection of the hands was reported in 16 (22.9%) individuals who had used gloves and antiseptics for work and food preparation, while majority 54 (77.1%) patients did not use them, with a significant correlation with Orf disease infection, *P* value<0.05. The mean (±SD) size of Orf lesion was 14.2±11 millimeters (ranged 4- 50 mm) and mean (±SD) numbers were 1.3± 0.7 (ranged 1-4). Based on the clinical stage of Orf, 26 (37.1%) of cases presented were in the targetoid stage, while other clinical stages were reported with lesser extent, *P* value <0.05 (Fig. 2).

In this study, only hands are affected, 42 (60%) patients had over left hand and 28 (40%) over right hand, 14% over thumb, and 8% over palm. Mean (± SD) time of cure was 5.8±0.7 weeks (range 4-7 weeks). Six weeks were significantly required for self-healing of Orf disease, *P* value <0.05 (Table 1), (Fig. 3).

The symptoms and complications occurred during disease progression and the mean duration of time reported was 8.1± 6.5days (range 1-24 days) (Table 1). It involved 52 (36.4%) individuals who had local pain, other symptoms included loss of function, mild swelling, itching, and fever. They were seen in 36 (25.2%), 28 (19.6%), 20 (14%), and 14 (9.8%) patients, respectively. Moreover, 18 (12.6%) had cellulitis, while 6 (4.2%) had paronychia (Fig. 4A), and 4 (2.8%) had lymphangitis. Erythema multiforme was reported in 4 (2.8%) cases (Fig. 4B), whereas 10 (7%) did not have Orf symptoms and complications (Fig. 5).

Fig. 4: A. Orf paronychia of ring finger. B. Orf complicated by erythema multiforme

Table 2: Correlation analysis regarding age, occupation, personal history, duration, season, the disease was contracted after Eid, preceding mild trauma at site and the use of gloves and antiseptic

	Age	**Occupation**	**Duration of illness - days**	**Time/ season**	**Examination after Eid**	**History of preceding trauma**	**Use gloves, antiseptic**
Age	1	-.125	.259**	-.171-*	-.049	-.021	.091
Occupation	-.125	1	-.160	-.041	-.081	-.097	-.721-**
Duration of illness –days	.259**	-.160	1	-.195-*	.009	-.118	.034
Time at season	-.171-*	-.041	-.195-*	1	.089	-.107	.025
Examination after Eid	-.049	-.081	.009	.089	1	-.201-*	.067
History of preceding trauma	-.021	-.097	-.118	-.107	-.201-*	1	.074
Use gloves, antiseptic	.091	-.721-**	.034	.025	.067	.074	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

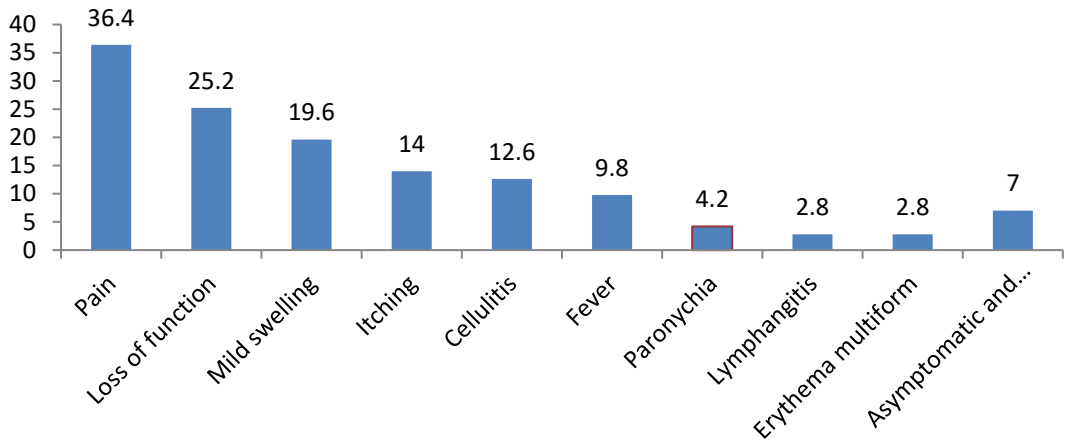

Fig. 5 Frequency (%) of symptoms and complications in Orf (n=70)

Table 3: Correlation data of patients and control regarding age, occupation, gender, the use of gloves and the preceding injury

	Mean age ±SD	**Occupation**		**Gender**		**Use of gloves and antiseptics**	**Preceding mild injury at site**
		Butcher	**Housewife**	**Male (n=34)**	**Female (n=116)**		
Patients	39.8± 8.8	14(41.2%)	56(48.3%)	14(41.2%)	56(48.3%)	16(22.9%)	54(77.1%)
Control	37.2 ± 8.9	20(58.8%)	60(51.7)	20(58.8%)	60(51.7%)	12(15%)	32(40%)
P value	0.083	0.466		0.466		0.4496	0.017

Statistically, a significant correlation was found between age, season, and duration of illness. Moreover, a major association was seen between the occupational groups, use of gloves and antiseptics in their work or food preparation. A significant correlation was shown between history of preceding trauma and examination after Eid (Table 2). Regarding the frequency of Orf according to the time of season, this study found that Orf disease is significantly more common in summer and autumn, *P* value < 0.05 (Fig. 6).

Demographic data concerning Orf patients and control group are presented in (Table 3). These data revealed that patients with Orf disease had a history of trauma before the appearance of lesion and there was a significant variation, *P* value= 0.017. However, there were no important differences between the patients' group and control group regarding age, gender,

occupation, and the use of gloves and antiseptics at work and food preparation, *P* value= 0.44.

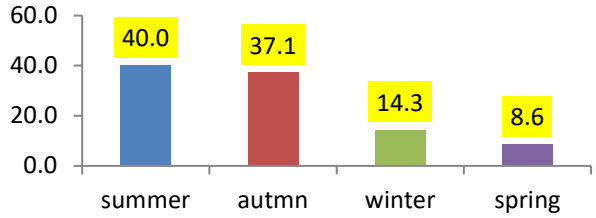

Fig. 6 Frequency of Orf according to seasons
P value < 0.05

Complete blood counts and glycemic state were within normal ranges, HIV Ab-Ag test of all patients was negative. Patients did not have a history of immunosuppressive drug consumption, nor any low immune states. In four doubtful cases, an incisional biopsy and a histopathological study were performed that showed moderate epidermal hyperplasia, spongiform degeneration with vacuolated cells, and inflammatory infiltration in the dermis.

DISCUSSION

Orf (Pacha boil) is a viral infection that belongs to "*parapox* genus of DNA viruses that usually infects sheep and goats". It is transmitted to humans by direct inoculation. Clinical feature is usually a single boil at the abrasion site, most often on the hands or fingers. Nodule appears several days after contact and advances through 6 stages with every clinical stage lasting a week, with self-resolution after approximately 6 weeks (1, 6, 12).

This study had 80% females, 20% males, *p* value<0.05 with infection. All patients were living in an urban area. Although butchers deal with sheep in their daily work, they have a great experience in sacrificing, cleaning, and slaughtering with minor trauma risks. Moreover, they comply with proper hygiene measures.

This research reported that during the holiday and vacation weeks (Eid ul-Adha and Eid ul-fitr), each occur once a year. People prefer eating Pacha dishes, a portion of a traditional Iraqi food made from sheep's head and trotters. Housewives clean, pick up, and break Pacha into small parts with their hands in an amateur way. She holds the axe in her right hand and the carcass in left hand. This may lead to minor hand trauma by contaminated carcass bone in 77.1% of patients, with a significant correlation within the patient group and between patient- control groups, *P* value=0.017. This mild trauma followed by appearance of Orf lesions in hand, especially the left one in 60% of cases where the patient holds the carcass bone, and 40% in the right hand where he/she holds the axe.

In addition, lesions most frequent among the studied occupations were exhibited in those who fed and slaughtered animals, suggesting that the disease is transmitted via contact. Studies found that disease incidence was higher in men (6, 14). In non-occupational settings, where safe practices cannot be applied, trauma can occur while handling animals, thus facilitating a site for Orf inoculation. Patients acquired cut wounds by animal bones, and sometimes a patient punctures his hand with a knife during slaughter (15). Another study reported 89% of Orf cases that had direct exposure and mild injury with lesions more on right side (14).

This work observed a significant correlation between history of preceding trauma and onset of disease after Eid, with significant involvement in 65.7% of patients who acquired Orf after Eid events (holiday and vacation weeks). Pacha is a favorite Iraqi dish in the Muslim community. This finding agrees with other reports (14). Although men usually implement the slaughtering of sheep or goats, further sacrifice processes are done by housewives; Ghislain *et al.*, recognized 44 cases had Orf in their report, 42 of which were among Muslims. Their study observed Orf disease patients each year within same period but ten days prior (16). Other researchers reported that the plateau of Orf disease rises after "the Feast of Sacrifice" due to the slaughter of sheep or goats, predominantly by Muslims (5, 17).

Patients in this study were immune-competent without a history of recurrence or personal history of Orf. This is like a previous study in Jordan, which reported that Orf epidemics occur every year during “the Feast of Sacrifice” without relapse. (14) Another study reported two or more Orf disease attacks might occur in patients with immunocompromised state or patients on corticosteroid or immunosuppressive therapy (18).

This study showed that no spread of Orf occurred from one human to another. The lesion had not extended to other parts of the body other than the first one, 20% of the patients had multiple lesions and all of them appeared at the onset. The author reported that 77.1% of cases did not use gloves and antiseptics during their work and food preparation, while 22.9% of individuals were using them, with a significant association with Orf disease infection, *P* value<0.05. This agrees with another study in which the transmission of Orf between people has not been reported with the most active protective tool against Orf infection being the use of gloves when coming in contact with sheep or goats (1). A literature review about Orf potential complications include fever, secondary bacterial infection, lymphangitis, and lymphadenopathy. Furthermore, patients have been described with Orf disease associated with erythema multiforme, Stevens-Johnson syndrome, bullous pemphigoid, blistering eruptions, and toxic erythema.

A distinctive Orf-induced immunobullous disease has been reported in two cases. (19, 20) Another study has found 59.5% of cases presenting without complications (6).

In this study, 36.4% of patients had local pain, while loss of function, mild swelling, itching, and fever were seen in 25.2%, 19.6%, 14%, and 9.8% of patients, respectively. Moreover, cellulitis occurred in 12.6% of cases, 4.2% of patients complained of paronychia, and it was not reported in previous literature and 2.8% lymphangitis. Erythema multiforme was observed in 2.8% of cases, whereas 7% of patients did not have Orf symptoms. Mean time of development of complications after the onset of Orf was 8.1±6.5 days, and this makes patient look for medical advice and explains the multiple stages of clinical presentation. Patients with Orf consult a dermatologist once complications develop or when healing is delayed. In addition to that, our society self-diagnose Pacha boil, and they know it as a self-limiting disease.

The lunar months and the Eid time are rotating during years. The present research reported that the Eid events occurred at the end of summer and beginning of autumn and found that Orf disease was significantly common at summer in 40% of patients and autumn in 37.1% with *P*-value < 0.05. Other researchers found that Orf disease increases in animals and human, and infections are commonly reported during spring and summer seasons. The seasonal variation in human Orf disease occurrence has been previously noted in other studies (5, 7, 21). The current work data concluded that Orf involved only the hands, and lesions occurred on left hand in 60% of individuals and 40% on right hand. Other studies reported that lesion commonly occurs on hands and fingers, but it can happen on face, nostrils, tongue, eyelids, and perianal region (5).

Orf lesions resolved without a scar in 85.7% of cases, while incubation period was 3-9 days, and size of lesions ranged between 4-50 mm. Five clinical stages progression, and 5–8 weeks resolving time without scarring was noted. 37.1% patients presented in targetoid stage, P value <0.05, this likely attributed to the under recognition of disease, late presentation, and misdiagnosis. This finding was like other studies (22-24).

The limitation of the present study is the diagnosis of disease which depends on history and clinical examination without taking a biopsy and histopathology for all patients. Quantitative PCR for *Parapox* virus was unavailable.

CONCLUSION

Orf (Pacha boil), is a self-limiting disease that affects housewives who have unprofessional handling of Pacha, bad hand hygiene without adequate protective measures. The disease is common after Eid events. Early diagnosis is important for appropriate treatment and avoidance of different potential complications and unnecessary surgeries. Authors recommend that housewives cook only Pacha without breaking it, with appropriate preventive methods, and good hand hygiene.

CONFLICT OF INTEREST

Author declares that there is no conflict of interest for the present study.

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