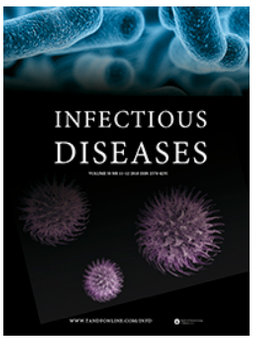

Infectious Diseases

ISSN: 2374-4235 (Print) 2374-4243 (Online) Journal homepage: https://www.tandfonline.com/loi/infd20

Chlamydophila psittaci pneumonia associated to exposure to fulmar birds (*Fulmaris glacialis*) in the Faroe Islands

Marian Elsubeth Fossádal, Mansour Grand & Shahin Gaini

To cite this article: Marian Elsubeth Fossádal, Mansour Grand & Shahin Gaini (2018) *Chlamydophila psittaci* pneumonia associated to exposure to fulmar birds (*Fulmaris glacialis*) in the Faroe Islands, Infectious Diseases, 50:11-12, 817-821, DOI: 10.1080/23744235.2018.1495840

To link to this article: https://doi.org/10.1080/23744235.2018.1495840

Published online: 21 Sep 2018.

Taylor & Francis
Taylor & Francis Group

INFECTIOUS DISEASES,
2018; VOL. 50,
NO. 11-12, 817–821

https://doi.org/10.1080/23744235.2018.1495840

ORIGINAL ARTICLE

Check for updates

Chlamydophila psittaci pneumonia associated to exposure to fulmar birds (*Fulmaris glacialis*) in the Faroe Islands

Elsubeth Marian Fossádal[a], Mansour Grand[b] and Shahin Gaini[a,c,d]

[a]Medical Department, Infectious Diseases Division, National Hospital Faroe Islands, Tórshavn, Faroe Islands; [b]Department of Radiology, National Hospital Faroe Islands, Tórshavn, Faroe Islands; [c]Infectious Diseases Research Unit, Odense University Hospital and University of Southern Denmark, Odense, Denmark; [d]Centre of Health Research and Department of Science and Technology, University of the Faroe Islands, Tórshavn, Faroe Islands

ABSTRACT

Background: For more than 200 years people in the Faroe Islands have supplemented their food by hunting different species of wild birds in the Faroe Islands. Traditionally, juvenile fulmars (*Fulmarus glacialis*) are caught at sea in late August. The fulmars may be infected or colonized with the bacterium *Chlamydophila psittaci* which may infect the hunter by the respiratory route and mostly presents as an atypical pneumonia, also called psittacosis or ornithosis or parrot fever. In the Faroe Islands it is called 'nátasjúka' meaning 'fulmar disease'. Historically, it has also been called 'September Pneumonia' in the Faroe Islands.

Methods: A case series with patients infected with *Chlamydophila psittaci*.

Results: All four cases presented in this article occurred around the month of September. Improved hygiene measures during the last 50 years in handling the fulmar birds have led to a decline of verified psittacosis in the Faroe Islands. After the last two hunting seasons (2016–2017), four cases of psittacosis were diagnosed and treated in the Faroe Islands. Only nine cases of verified psittacosis have been reported to the Chief Medical Officer of the Faroe Islands during the last 27 years.

Conclusions: There is an association between catching and handling *Fulmarus glacialis* and human psittacosis disease in the Faroe Islands. Clinicians treating patients with contact with fulmars should be aware of this zoonotic disease.

KEYWORDS
Chlamydophila psittaci
Pneumonia
Psittacosis
Fulmar birds
Atypical pneumonia
Wild bird exposure

ARTICLE HISTORY
Received 7 May 2018
Revised 24 June 2018
Accepted 26 June 2018

CONTACT
Elsubeth Marian Fossádal
emfossadal@gmail.com
Medical Department, Infectious Diseases Division, National Hospital Faroe Islands, J.C. Svabosgøta 41-49, 100 Tórshavn, Faroe Islands

Introduction

Psittacosis is a zoonotic disease caused by the obligate intracellular bacterium *Chlamydophila psittaci* (CP) [1,2]. In humans, this pathogen can cause systemic illness but mostly presents with flu-like symptoms which later may be complicated with atypical pneumonia [2]. Many infected humans have a mild self limiting illness [2].

Many CP strains infect birds and other animals [3,4]. Transmission to humans occasionally occurs when there is close contact with the birds or bird material. CP infections in humans are associated to exposure from CP in bird urine, faeces or aerosolized, and thereby transmitted via the respiratory route in humans and may cause severe CP disease. The incubation period is 5–21 days. [1,5]. The four cases presented in this report all had relevant contact with fulmar birds.

Case series

Case 1

The first patient was a 75 years old man with chronic obstructive lung disease (COPD). He was hospitalized 18 September 2016 due to high fever with temperature of 40°C, impaired general condition, shortness of breath and elevated infection parameters including a CRP of 239 mg/l. He was initially treated with iv. cefuroxime at a local hospital. Chest X-ray showed bilateral diffuse infiltrative and interstitial changes (Figure 1). Cultures of blood and urine were negative. The antibiotic treatment was changed to iv. benzylpenicillin. The patient's respiratory condition deteriorated during the following 4 days. The antibiotic treatment was changed again to iv. piperacillin/tazobactam. After 8 days of hospitalization, the patient had increasing oxygen demands and was transferred to the intensive care unit at the National Hospital Faroe Islands. The patient was now treated with continuous positive airway pressure (CPAP) and iv. piperacillin/tazobactam and iv. ciprofloxacin. After another 2 days without significant clinical improvement, CP was identified in pleural fluid by PCR (Danish Reference Laboratory of Clinical Microbiology, Statens Serum Institut, SSI, Copenhagen, Denmark), (SSI). Treatment was now supplemented with oral doxycycline. The patient improved and was discharged the 3 October 2016 after 15 days of hospitalization with oral doxycycline planned for a total duration of 14 days. A control chest X-ray was taken 6 weeks after discharge and showed normalized conditions. The patient had been in contact with fulmar birds for 5 consecutive days in late August 2016.

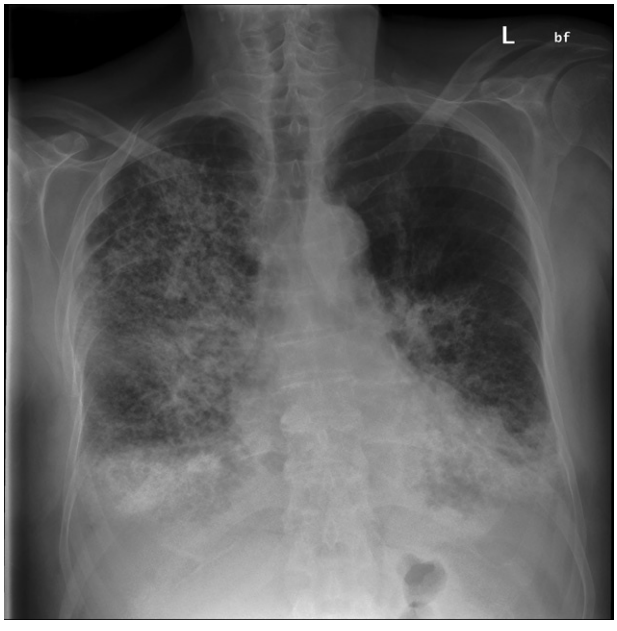

Figure 1. Bilateral diffuse infiltrative and interstitial changes predominantly on right side as well as minimal right sided pleural effusion.

Case 2

The second patient was a 70 years old man known with hypertrophic cardiomyopathy. He was hospitalized 04 September 2016 with fever, fatigue and cough. He had been treated for 4 days at a local hospital with iv. cefuroxime and a single dose iv. metronidazole. The clinical diagnosis was severe pneumonia, verified by chest X-ray. There was no improvement after 4 days of treatment. Iv. erythromycin was added because atypical pneumonia was suspected. The patients respiratory condition deteriorated and he was transferred to the National Hospital Faroe Islands for intensive care. The antibiotic treatment was now changed to iv. benzylpenicillin combined with iv. ciprofloxacin and iv. metronidazole. The patient did not improve and chest X-ray showed diffuse left sided infiltrative and interstitial changes. The possibility of psittacosis was now considered and oral doxycycline was added. PCR on sputum identified CP (SSI). The patient improved and after 11 days of hospitalization, he was discharged 15 September 2016 in his habitual state with oral doxycycline planned for a total duration of 14 days. Six weeks later the patient was seen in the out-patient clinic. He was in his habitual state and the chest X-ray had normalized. This patient had been cleaning approximately 1500 fulmar birds in late August 2016.

Case 3

The third patient was a 60 years old man with diabetes and hypertension. He was admitted 5 September 2017 to the National Hospital Faroe Islands with high fever and poor general condition but no dyspnoea. He was initially treated according to our guidelines with iv. benzylpenicillin on suspicion of community acquired pneumonia. The patient was not improving after 24 hours of treatment. He still had general weakness, fever and nausea, but no dyspnoea. CRP increased from 170 mg/l to 248 mg/l. Chest X-ray showed infiltrates in the basal and the superior lobes of the right lung. The patient now informed the physicians that he had been hunting fulmar birds during 7 consecutive days 2 weeks earlier. Oral doxycycline was now added to his antibiotic treatment. Forty-eight hours later, he had normal temperature and he was improving clinically. PCR on sputum diagnosed CP (SSI). After 7 days of hospitalization, the patient was discharged 11 September 2017 in his habitual state with oral doxycycline planned for a total duration of 14 days. He was seen in the out-patient clinic six weeks later. The patient was in his habitual state and the chest X-ray had normalized.

Case 4

The fourth patient was a 55 years old man without any known diseases. He had been complaining of body and muscle aches and poor appetite for several days. He was admitted 19 September 2017 to the National Hospital Faroe Islands with high fever, some confusion and trouble standing up. There was some cough, but not productive. From the start atypical pneumonia was suspected since the bird catching season was just over, and the patient was an active fulmar hunter. He was initially treated with iv. benzylpenicillin and oral doxycycline from the day of admission. The CRP rose within the first 24 hours from 239 mg/l to 274 mg/l. Chest X-ray showed a small right sided apical nodule. A chest CT scan confirmed right-sided basal pneumonia. After 36 hours of treatment, the patient was improving. He was almost in his habitual condition after 72 hours of treatment and he was discharged with oral doxycycline for an additional 14 days of treatment. Serology showed a significant increase in *Chlamydophila psittaci* IgG antibodies in plasma (from $<$100 to 1600) (SSI). The patient was seen in the out-patient clinic six weeks later. He was then his habitual state and chest X-ray and CT thorax had normalized. This patient had hunted and cleaned juvenile fulmars 2 weeks before onset of symptoms in August 2017. He had noticed several sick birds on the boat trip, but usually hunters do not catch visibly sick fulmar birds.

Discussion

Historically, psittacosis has been a feared disease in the Faroe Islands, as 179 people died in 1930–1939 around September, after the bird hunting season in late August [5,6]. The mortality rate was around 20% and, in pregnant women, around 80%. It was then forbidden to catch the fulmar birds in 1939–1954 [5]. Fulmar bird hunting was legalized again in 1954 with improved hygiene measures for hunting and handling the birds. In 1954–1990, 43 cases of psittacosis were reported to the Chief Medical Officer of the Faroe Islands. ($\sim$1 case/year) [7].

In the last 27 years (1991–2017), only nine cases of psittacosis were reported to the Chief Medical Officer of the Faroe Islands and none had a fatal outcome ($\sim$1 case/3.year). Thus, the number of verified cases has declined in the last 27 years.

There are no regular studies of CP infection in fulmar birds from year to year in the Faroe Islands. Thus, we do not know the yearly risk for infection in bird hunters. A single study from 1999 on 479 juvenile fulmar birds in the Faroe Islands found that 10% of the birds were infected [5]. In 1999, only one case of verified CP infection was reported to the Chief Medical Officer of the Faroe Islands.

A French study examined and sampled 195 North Atlantic wild seabirds in the period from 2011–2014 and found that 18.5% were infected with *Chlamydiaceae species* [3], but since the birds were rescued and unhealthy, it does not show the prevalence in the bird population.

In international studies, psittacosis is mostly reported in veterinary hospital staff, poultry slaugthers or poultry breeders for food production [8]. In the Faroe Islands, the risk for psittacosis is greatest in September after the bird hunting season.

Our four cases all had relevant exposure to juvenile fulmar birds in late August for several days (Figure 2). Exposure was particularly high when cleaning the birds, which includes picking the feathers and cleaning the intestinal tract, which hosts the CP bacteria (Figure 3).

All four patients reported using chlorine handwash when in contact with the birds as recommended by the Faroese health authorities. The authorities do not recommend mouth protection and our patients did not use

Figure 2. Fulmar birds (Fulmarus glacialis).

Figure 3. Bird hunters cleaning and plucking the fulmar birds.

such protection when handling the birds. We believe that the risk for infection could be further reduced by carrying mouth protection when cleaning the birds. In addition, our patients and fulmar hunters in general report that they do not catch visibly ill fulmar birds. Thus, there is a natural bird selection which helps to reduce the risk for infection [4].

No fatal cases of psittacosis cases have been reported in the Faroe Islands after 1939. The risk for infection is well known in the population and we believe that bird hunters generally follow the hygiene recommendations.

Cases 1 and 2 from 2016 are almost identical. Both men were in their 70s and had concomitant diseases. They did not respond to the initial treatment for pneumonia. Their condition worsened and they developed severe disease. Psittacosis was then suspected due to the history of bird exposure. The patients were then treated with oral doxycycline and improved. These two patients had a long hospitalization principally due to the diagnostic delay. Their age and underlying diseases may have worsened their condition. Diagnostic delay and inappropriate initial treatment may be fatal [9].

Cases 3 and 4 from 2017 are also comparable and though these two younger patients were in better health and had a shorter history with flu-like symptoms, fever and few respiratory symptoms and no dyspnoe. Because of the bird catching season, the severely ill patients the year before, and the information that these patients had been exposed to fulmar birds, there was early suspicion of atypical pneumonia with CP. Both patients received appropriate empirical treatment covering CP and had a shorter hospitalization and milder illness than the first two patients.

Conclusion

There have been four detected cases of psittacosis in the last two years in the Faroe Islands compared to no cases in 2004–2015. We suspect that this it is due to underdiagnosis. Many infected individuals have a mild self-limiting illness and do not require hospitalization or treatment. Some patients may also be treated in the primary care on suspicion of an atypical infection without any diagnostic work-up [2]. Although the verified incidence of psittacosis in the population is low, there is a risk of infection in the bird catching season in late August. Good hygiene measures are of great importance as are adequate patient history and awareness of the risk for CP infection to avoid diagnostic delay.

Acknowledgments

We thank biologist Jens-Kjeld Jensen for kindly allowing us to use his fulmar bird pictures and doctor Marius Rasmussen for radiological assistance.

Disclosure statement

The authors report no conflicts of interest.

References

[1] Blomqvist M, Christerson L, Waldenström J, et al. Chlamydia psittaci in birds of prey, Sweden. Infect Ecol Epidemiol. 2012;2:8435.

[2] Hogerwerf L, De Gier B, Baan B, et al. Chlamydia psittaci (Psittacosis) as a cause of community-acquired pneumonia: a systematic review and meta-analysis. Epidemiol Infect. 2017;145:3096–3105.

[3] Aaziz R, Gourlay PH, Vorimore F, et al. Chlamydiaceae in North Atlantic seabirds admitted to a wildlife rescue center in Western France. Appl Environ Microbiol. 2015;81:4581–4590.

[4] Hermann B. *Chlamydophila psittaci* i stormfåglar på Färöarna – hur stor är infektionsrisken för människor? [Chlamydophila psittaci in the birds in The Faroe Islands – what is the risk of infection for humans?]. Føroya Fuglafrøðifelag. 2004;1:11–12.

[5] Herrmann B, Persson H, Jensen JK, et al. *Chlamydophila psittaci* in Fulmars, the Faroe Islands. Emerg Infect Dis. 2006;12:330–332.

[6] Rasmussen RK. Uber eine durch Sturmvogel ubertragbar lungenerkrankung af den Fareorn. [About a lung illness transmitted by sea birds in the Faroe Islands]. Xenralblatt für Bakteriologie. Parasitenkunde Und Infektionskrankheiten. 1938;143:89–93.

[7] Official medical reports for the Faroe Islands. 1991–2016. Report are available at https://stps.dk/da/om-os/landslaeknin/dansk-danskt/udgivelser/

[8] Vorimore F, Thébault A, Poisson S, et al. *Chlamydia psittaci* in ducks: a hidden health risk for poultry workers. Pathogens Dis. 2015;73:1–9.

[9] Petrovay F, Balla E. Two fatal cases of psittacosis caused by Chlamydophila psittaci. J Med Microbiol. 2008;57:1296–1298.