Leptospirosis in humans: diagnosis of acute febrile illnesses during the COVID-19 pandemic

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Leptospirosis vs COVID-19

Human leptospirosis

Acute undifferentiated fever with possible headache, muscle pain, chills, jaundice, renal failure

Coronavirus disease (COVID-19)

Acute undifferentiated fever with a variety of clinical manifestations, including cough, headache, myalgia, fatigue.

CLINICAL FEATURES AND DIFFERENTIAL DIAGNOSIS OF LEPTOSPIROSIS*

CLINICAL FEATURES		DIFFERENTIAL DIAGNOSIS	
• fever • severe headache • myalgias • conjunctival suffusion • jaundice • general malaise • stiff neck • chills • abdominal pain • joint pain • anorexia • nausea	• vomiting • diarrhoea • oliguria/anuria • haemorrhages • skin rash • photophobia • cough • cardiac arrhythmia • hypotension • mental confusion • psychosis • delirium	• influenza • dengue and dengue haemorrhagic fever • hantavirus infection, including hantavirus pulmonary syndrome or other respiratory distress syndromes • yellow fever and other viral haemorrhagic fevers • rickettsiosis • borreliosis • brucellosis • malaria • pyelonephritis • aseptic meningitis	• chemical poisoning • food poisoning • typhoid fever and other enteric fevers • viral hepatitis • pyrexia of unknown origin (PUO) • primary HIV seroconversion • legionnaire's disease • toxoplasmosis • infectious mononucleosis • pharyngitis • **Coronavirus disease (COVID-19)??**

*WHO 2003: HUMAN LEPTOSPIROSIS: GUIDANCE FOR DIAGNOSIS, SURVEILLANCE AND CONTROL

CLINICAL FEATURES COVID-19 vs LEPTOSPIROSIS

Coronavirus disease (COVID-19)*	Coronavirus disease (COVID-19) and Leptospirosis	Leptospirosis**
Most common symptoms		**Most common symptoms**
fever	fever	**fever (97%)**
dry cough		
tiredness		
	headache	**headache (68%)**
	chills	**chills (63%)**
	diarrhea	**diarrhea (57%)**
	vomiting	**vomiting (49%)**
	general malaise	
	skin rash	
	abdominal pain	
	anorexia	
	nausea	
	mental confusion	
	delirium	
		myalgias (75%)
		conjunctival suffusion (48%)
		jaundice (52%)
		oliguria/anuria (36%)

CLINICAL FEATURES COVID-19 vs LEPTOSPIROSIS

Coronavirus disease (COVID-19)*	Coronavirus disease (COVID-19) and Leptospirosis	Leptospirosis**
sore throat		
loss of taste or smell		
difficulty breathing or shortness of breath		
chest pain or pressure		
loss of speech or movement		
common cold, dizzy		
discolouration of fingers or toes		
ocular pain		
conjunctivitis		
aches and pain		
		stiff neck
		haemorrhages
		cardiac arrhythmia
		hypotension
		cough
		joint pain
		photophobia

*https://www.who.int/health-topics/coronavirus#tab=tab_3 and https://lci.rivm.nl/richtlijnen/covid-19

** WHO 2003: HUMAN LEPTOSPIROSIS: GUIDANCE FOR DIAGNOSIS, SURVEILLANCE AND CONTROL / Olszyna DP, Jaspars R, Speelman P, van Elzakker E, Korver H, Hartskeerl RA. Leptospirose in Nederland 1991-1995 [Leptospirosis in the Netherlands, 1991-1995]. Ned Tijdschr Geneeskd. 1998 May 30;142(22):1270-3.

Leptospirosis in times of COVID-19 pandemic

- Focus on possible COVID-19 patients
- Only to health facility when seriously sick
- Avoid to visit health facility to avoid contact with possible COVID-19 patients
- Increased work load microbiology laboratories
- Less traveling abroad
- Stay at home / More outdoor recreation

Laboratory diagnosis of leptospirosis

Leptospirosis Reference laboratory Amsterdam

PCR (in house), Culture,

ELISA (in house), MAT (Microscopic Agglutination Test)

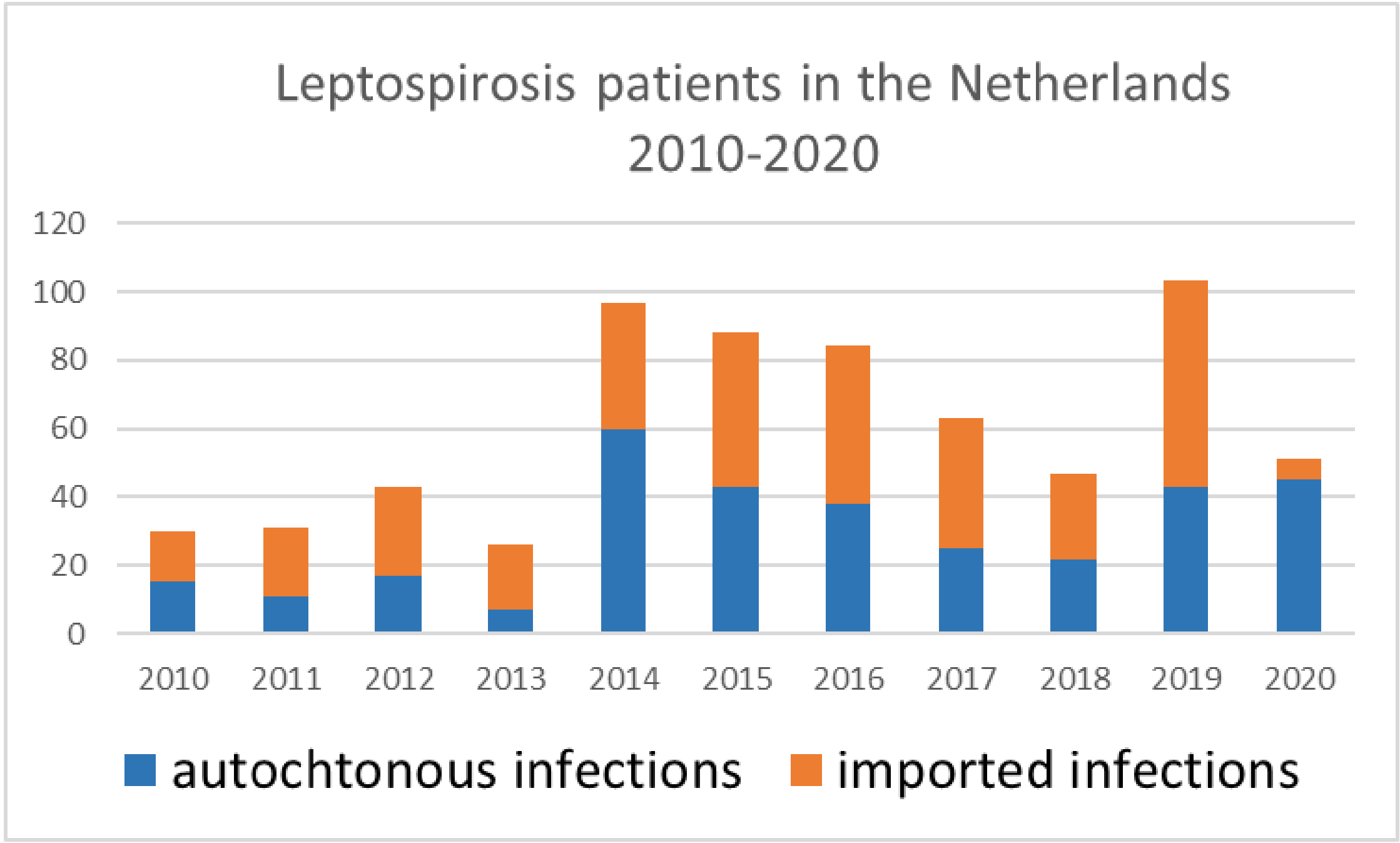
	≤10 days post onset symptoms	>10 days post onset symptoms
Culture blood	yes	
Culture urine		yes
PCR blood	yes	
PCR urine	yes	yes
ELISA	yes	yes
MAT		yes

Confirmed leptospirosis cases

leptospirosis cases:

- Treated with Antibiotics 84%
- Hospital Admission 74%
- Intensive Care Admission 18%
- Dialysis 12%
- Deceased 3%

Goris MG, Boer KR, Duarte TA, Kliffen SJ, Hartskeerl RA. Human leptospirosis trends, the Netherlands, 1925-2008. Emerg Infect Dis. 2013 Mar;19(3):371-8.


Leptospirosis patients in the Netherlands 2010-2020
120
100
80
60
40
20
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
autochtonous infections
imported infections

Positivity rate of suspected leptospirosis and male/female distribution (the Netherlands)

year	Positivity rate	Male proportion
	(number of positive leptospirosis patients/ number of submitted suspected patients)*100%	(number of males/ number of positive leptospirosis patients)*100%
2017	5.9 %	76.2%
2018	5.3 %	78.7 %
2019	10.7 %	80.4 %
2020	7.7 %	88.7 %

Autochtonous leptospirosis infections (the Netherlands)

routes of infection

year	Job related (≥%)	Recreational activities (≥%)	Surface water contact (≥%)
2017	12	32	52
2018	13	32	50
2019	35	44	56
2020	20	51	58

Conclusion

- Despite the COVID-19 situation, human leptospirosis cases still diagnosed in the Netherlands
- Less imported leptospirosis infections