



# A trip to Italy

Max De Preter

# Case

- 38y old male
- 10 days on holiday in Tuscany, returned 7 days ago
- Symptoms
  - **Headache** (occipital and neck) starting 4 days ago, progressive
  - **Blurry vision** since 2 days
  - **Nausea** and occasional **vomitting** since yesterday
  - Presented because of **balance** issues
- Profession: project manager (property)
- Avid cyclist including on holiday
- 2 yr old daughter has fever since 2 days, her creche is closed due to varicella outbreak



# Souvenirs from Italy



# Souvenirs from Italy continued...



# Case

Laboratorium	
<b>Algemene hemato</b>	
<input type="checkbox"/> Hematocriet	43,4
<input type="checkbox"/> Hemoglobine	14,4
<input type="checkbox"/> Erythrocyten	4,91
<input type="checkbox"/> MCV	88,4
<input type="checkbox"/> MCH	29,3
<input type="checkbox"/> MCHC	33,2
<input type="checkbox"/> RDW	12,6
<input type="checkbox"/> Trombocyten	175
<input type="checkbox"/> MPV	10,4
<input type="checkbox"/> Leukocyten	7,19
<input type="checkbox"/> Absolute neutrofilie	5,82
<input type="checkbox"/> Absolute lymfocytose	0,90
<input type="checkbox"/> Absolute monocytose	0,42
<input type="checkbox"/> Absolute eosinofilie	(L) 0,01
<input type="checkbox"/> Absolute basofilie	0,02
<b>Hematologie formule</b>	
<input type="checkbox"/> Segmentkernigen	(H) 80,9
<input type="checkbox"/> Lymfocyten	(L) 12,5
<input type="checkbox"/> Monocyten	5,8
<input type="checkbox"/> Eosinofielen	(L) 0,1
<input type="checkbox"/> Basofielen	0,3
<input type="checkbox"/> Immature granulocyten	0,4

<b>Algemene biochemie</b>	
<input type="checkbox"/> Creatinine	(H) 1,16
<input type="checkbox"/> eGFR CKD-EPI	* (L) 79
<input type="checkbox"/> Ureum	30
<input type="checkbox"/> Natrium	139
<input type="checkbox"/> Kalium	4,3
<input type="checkbox"/> Chloride	102
<input type="checkbox"/> Bicarbonaat (HCO <sub>3</sub> )	27
<input type="checkbox"/> Anion gap (berekend)	* 10
<input type="checkbox"/> CRP (C-reactief proteïne)	2,1
<input type="checkbox"/> Troponine I	<3
<input type="checkbox"/> Glucose (serum)	105
<input type="checkbox"/> LDH (lactaatdehydrogenase)	166
<input type="checkbox"/> CK (creatine kinase)	84
<input type="checkbox"/> ALT (GPT)	21
<input type="checkbox"/> Alkalische fosfatase	68
<input type="checkbox"/> GGT (gamma-glutamyltransferase)	28
<input type="checkbox"/> Lipase	33
<input type="checkbox"/> Totaal bilirubine	0,88
<input type="checkbox"/> Geconjugeerde bilirubine	0,25
<input type="checkbox"/> Ongeconjugeerde bilirubine	0,63
<b>Hormonologie</b>	
<input type="checkbox"/> TSH	0,78
<input type="checkbox"/> fT4	15,9
<b>Serologie</b>	
<input type="checkbox"/> Borrelia IgG	* <5.0
<input type="checkbox"/> Borrelia IgM	Negatief
Treponema pallidum RPR	RPR wordt en
Treponema pallidum TPHA screen.	negatief
HIV (1 - 2)	negatief

**Materiaal:** CSV via punctie

**Microscopie  
Celtelling:**

° Leukocyten	:	307	/μL
° Erythrocyten	:	<1000	/μL
Mononucleaire cellen:		94.7	%
Segmentkernige cellen:		5.3	%

**Gramkleuring:**  
Geen kiemen gezien

**Aerobe kweek:** **Positief voor** Micrococcus species  
*Klinisch relevant?*

**Anaerobe kweek** Geen strikt anaerobe bacterien gekwee

PCR Enterovirus:	Negatief
PCR Herpes simplex virus type 1:	Negatief
PCR Herpes simplex virus type 2:	Negatief
PCR Humaan parechovirus:	Negatief
PCR Humaan herpes virus 6:	Negatief
PCR Varicella zoster virus:	Negatief
PCR Streptococcus pneumoniae:	Negatief
PCR Neisseria meningitidis:	Negatief
PCR Streptococcus agalactiae:	Negatief
PCR Listeria monocytogenes:	Negatief
PCR Haemophilus influenzae:	Negatief
PCR Escherichia coli K1:	Negatief
PCR Streptococcus pyogenes:	Negatief
PCR Mycoplasma pneumoniae:	Negatief
PCR Cryptococcus neoformans/gattii:	Negatief

# Case

- Medical imaging  
**MRI brain:** no abnormalities found suggestive of meningitis of encephalitis.
- Empirically started on high-dose aciclovir and ceftriaxone by the neurologist after LP.



# Case

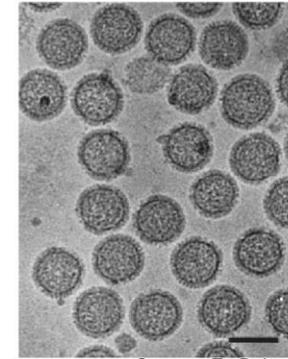
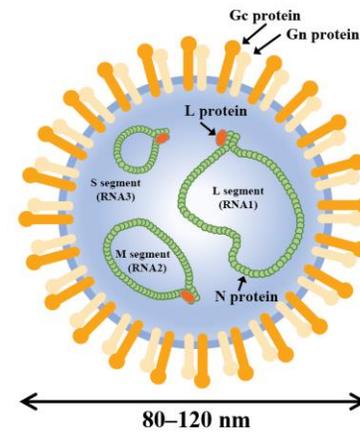
- Diagnosis: **Toscana Virus**
  - Positive IgM and IgG serology on serum sample

Sandfly fever virus IgG	1/400
Sandfly fever virus IgM	positief

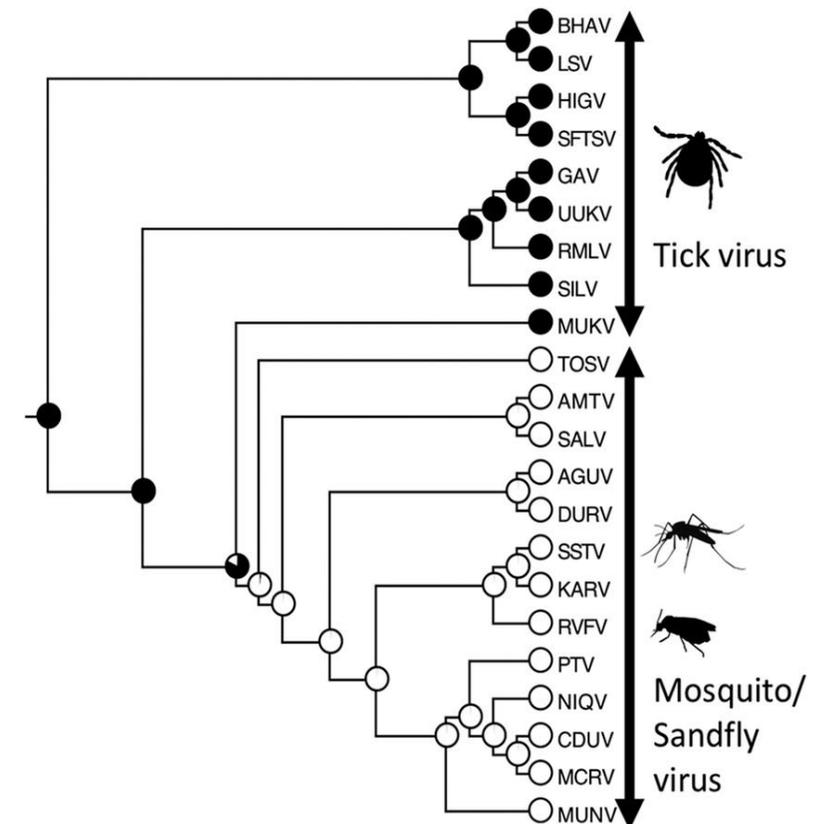
- Evolution:
  - Pt underwent second LP to rule out Varicella Zoster Encephalitis
  - Aciclovir and ceftriaxone were discontinued
  - Post-dural puncture headache after LP
  - Follow-up appointment 4weeks after consultation still headache and blurry vision but still improving gradually

# Toscana Virus

- arthropod-borne virus, transmitted by sandflies
- Phlebovirus, ss-RNA virus
- 3 genotypes (A,B,C)
- First isolated in 1971 from sandflies in Tuscany
- Animal reservoir unknown



Sasaya, T., Palacios, G., Briese, T., Di Serio, F., Groschup, M. H., Neriya, Y., Song, J. W., & Tomitaka, Y. (2023) ICTV Virus Taxonomy Profile: *Phenuiviridae* 2023, *Journal of General Virology*, 104, 001893



The Unique Phylogenetic Position of a Novel Tick-Borne Phlebovirus Ensures an Ixodid Origin of the Genus Phlebovirus - Scientific Figure on ResearchGate. Available from: [https://www.researchgate.net/figure/Phlebovirus-ancestral-state-reconstruction-The-phylogenetic-tree-based-on-the-nucleotide\\_fig6\\_325744821](https://www.researchgate.net/figure/Phlebovirus-ancestral-state-reconstruction-The-phylogenetic-tree-based-on-the-nucleotide_fig6_325744821) [accessed 11 Oct 2025]

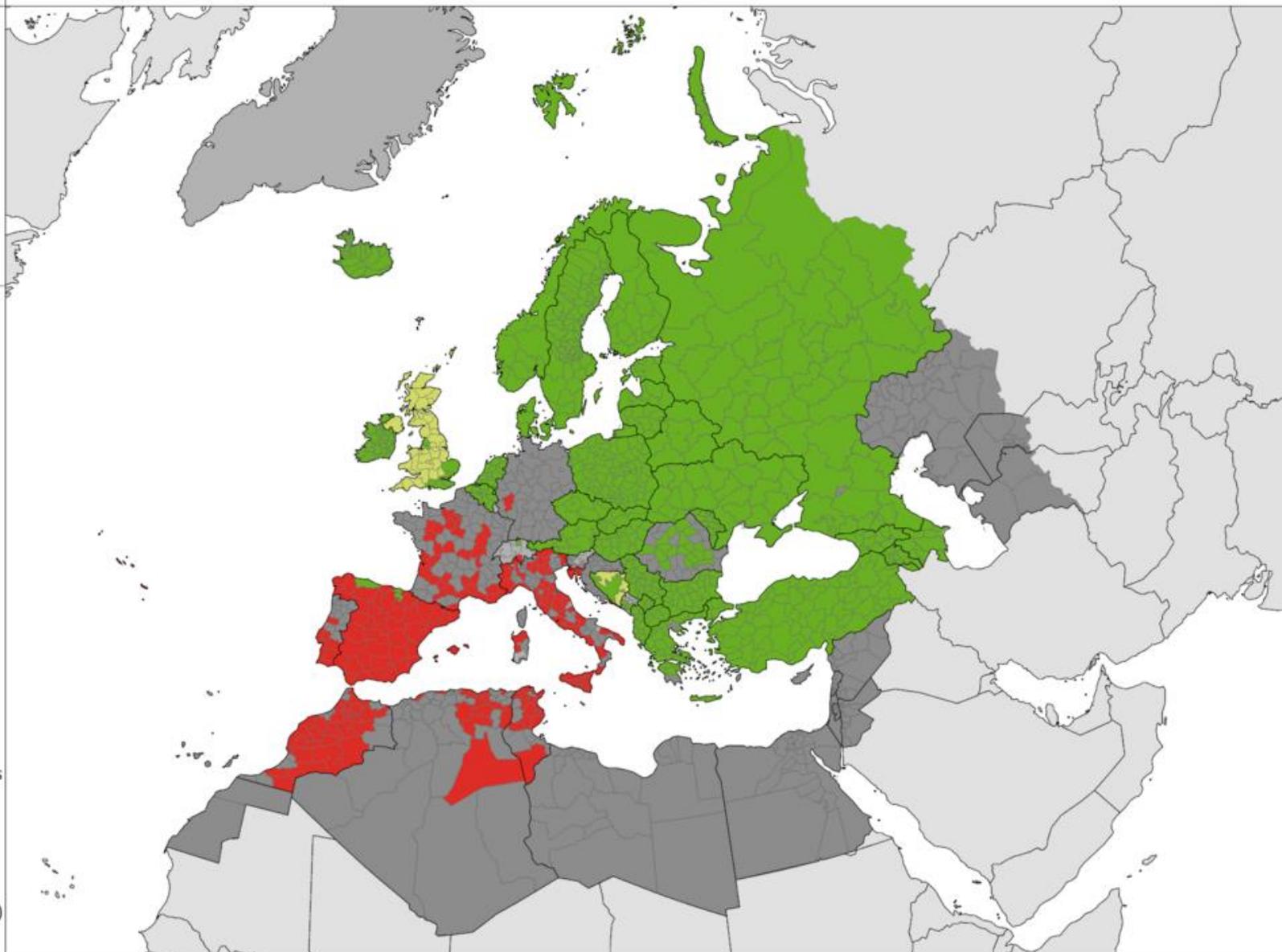
Disease/Characteristic	Vector	Disease pattern	Clinical symptoms
Toscana Virus	<i>Phlebotomus perniciosus</i> - sandfly	Summer - Fall Mediterranean region	Aseptic meningitis, myalgia
Sicilian Virus	<i>Phlebotomus papatasi</i> - sandfly	Summer - Fall Southern Europe - Asia	Headache, myalgia
Naples Virus	<i>Phlebotomus papatasi</i> - sandfly	Summer - Fall Southern Europe - Asia	Headache, myalgia
Rift Valley Fever	<i>Aedes mcintoshi</i> - mosquito	Rainy season, outbreaks Sub-Saharan Africa	Headache, arthralgia, retinitis, encephalitis
Heartland Virus Disease	<i>Ambylomma americanum</i> - Lone Star Tick	Summer - Fall Midwestern and southern United States	Headache, GI, cough, confusion, arthralgia
Severe fever with thrombocytopenia syndrome (SFTS)	Various species of ticks	Summer - Fall China, South Korea, Japan	Headache, GI, myalgia, arthralgia

**Legend**

- Present
- Introduced
- Antic. Absent
- Obs. Absent
- No data
- Unknown

**Countries/Regions not viewable in the main map extent\***

-  Malta
-  Monaco
-  San Marino
-  Gibraltar
-  Liechtenstein
-  Azores (PT)
-  Canary Islands (ES)
-  Madeira (PT)
-  Jan Mayen (NO)



ECDC and EFSA, map produced on 26 Sep 2023. Data presented in this map are collected by the VectorNet project. Maps are validated by external experts prior to publication. Please note that the depicted data do not reflect the official views of the countries.  
 \* Countries/Regions are displayed at different scales to facilitate their visualisation. The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. Administrative boundaries © EuroGeographics, UNFAO.



# Toscana Virus

- Majority of cases go undetected (high degree of seroprevalence)
- All cases occur from April-November
- Incubation period: 3-7 days (up to 14 days possible)
- Symptoms:
  - Fever
  - Headache (occipital and neck): **90%**
  - Nausea and vomiting
  - (Focal neurologic deficits)
  - (Rash)
  - (Myalgia)
- Complications:
  - Encephalitis **40%**
  - GBS
  - Testicular pain

# Toscana virus

- Definitive diagnosis
  - RT-PCR in bodily fluids (CSF, blood, others?), presumably only present in early infection
  - Serology
    - Seroconversion or fourfold antibody-titre increase in paired samples
- Probable diagnosis
  - Serology
    - Positive IgM antibody titre in a patient with neurological symptoms (IgM wanes and disappears over time)
- Treatment: supportive

# Sources

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