PHAC: COVID-19 Vaccine Emerging Issues Webinar: Vaccine-induced Immune Thrombotic Thrombocytopenia (VITT)

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Vaccine-induced Immune Thrombotic Thrombocytopenia (VITT) following ChAdOx1 nCoV-19 Vaccination

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Declaration of interest

- I have no financial conflicts of interest to declare
- I have no intellectual conflicts of interest to declare
What we’ll cover today

- What is VITT?
- How do I rapidly identify VITT?
- How do I treat VITT?
- Next steps and unanswered questions
A “typical” case

- 56 year old woman who received COVISHIELD (ChAdOx1 nCov-19) vaccine 12 days ago at her local pharmacy
- Presents to her family physician with severe headache, diplopia
- No medical history, no family history, no medications
- Presenting platelet count: 31 x 10⁹/L (normal 150 – 400 x 10⁹/L)
- What’s going on? And does the vaccine she received have anything to do with it?
What is VITT?

- Newly described syndrome: **thrombosis** and **thrombocytopenia**, in a typical **timeframe** after vaccination
  - Thromboses generally in unusual sites
  - Thrombocytopenia generally dramatic
  - Patients generally healthy before presentation
- Case fatality high (40%) in reported cases
- Pathophysiology?
  - Antibodies to platelet factor 4-polyanion complexes

Greinacher A. NEJM 2015; 373:252-261
If your jurisdiction uses the ChAdOx1 nCov-19 vaccine, be aware of VITT
The challenge: quickly rule VITT in (or out) and initiate life saving treatment

- **Suspected VITT**: symptoms + time frame + basic tests
- **Presumptive VITT**: advanced tests + imaging
- **Confirmed VITT**: specialized tests

Be aware of TYPICAL symptoms in a TYPICAL time frame after vaccination

- Typical symptoms of arterial or venous clots
  - Persistent and severe headache, focal neurological symptoms, seizures, blurred or double vision (suggesting cerebral vein thrombosis or arterial stroke)
  - Shortness of breath or chest pain (suggesting pulmonary embolism or acute coronary syndrome)
  - Abdominal pain (suggesting splanchnic thrombosis)
  - Limb swelling, redness, pallor, or coldness (suggesting deep vein thrombosis or acute limb ischemia)
- Typical time frame is 4 to 28 days post-vaccination

Suspected diagnosis?
Focus on basic testing with high NPV

- Key questions:
  - Symptoms?
  - Date of the vaccine?

- Key diagnostics:
  - Complete blood count (CBC)
Presumptive diagnosis? Focus on advanced tests and imaging

Key diagnostics:
- **D-dimer (> 2000 mcg/mL FEU or DDU)**
- **Blood film should show only thrombocytopenia**
  - Mimickers may have other abnormalities
- **Imaging**
  - Non-contrast CT brain not sensitive enough to rule out CSVT in setting of hematologic findings and suggestive symptoms
  - CT venogram is rapid, accessible, and accurate
  - MR/MR venography may be a practical alternative
HIT testing: immunobinding and functional assays

Enzyme-immunoassay is required as rapid assays seem to be insensitive

IVIG may inhibit reaction, so draw samples before infusion

National Platelet Immunology Lab at McMaster University: https://fhs.mcmaster.ca/plateletimmunology/documents/VIPIT_test_requisition.pdf

Initial management: anticoagulation and managing the immune reaction

- NO heparin
- NO platelet transfusions
- First line anticoagulation:
  - Direct oral anti-Xa inhibitors
  - If patient unstable, or renal function is impaired, consider parenteral anticoagulants
- IVIG 1 g/kg daily for 2 days for severe or life-threatening blood clots
- Report to Public Health and Health Canada

Hematology consultation + HIT ELISA

Many questions remain – for clinicians, regulators, and the public

- When do we use second line treatment (steroids, plasma exchange)?
- Do these antibodies persist?
- How do we monitor patients at discharge?
- What are the implications for the second dose of AZ and other vaccinations?
- Is this the same as the adverse events reported after the J&J vaccine?

https://covid19-sciencetable.ca/

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Reporting and Adverse Event Following Immunization (AEFI):


• AEFI report form: Reporting Adverse Events Following Immunization (AEFI) in Canada

• Submission of AEFI reports: User guide to completion and submission of the AEFI reports
NACI Statement on COVID-19 Vaccines

• Refer to NACI recommendations on the use of COVID-19 vaccines for guidance on COVID-19 vaccines.
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