

Vaccine induced thrombotic thrombocytopenia

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Disclosures

Speaker's name: **Ryan Zarychanski**

- Relationships with commercial interests:
 - Grants/Research Support: **No**
 - Speakers Bureau/Honoraria: **No**
 - Consulting Fees: **No**
 - Other: **No**

Speaker's name: **Vi Dao**

- Relationships with commercial interests:
 - Grants/Research Support: **No**
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 - Consulting Fees: **No**
 - Other: **No**



Objectives

- Review the case definition of VITT
- Discuss clinical presentation; when to suspect
- How to diagnosis VITT
- When to engage your local hematologist



Vaccine-induced immune thrombotic thrombocytopenia

- Thrombocytopenia (platelets $< 150 \times 10^9/L$)
 - Median age 36-54 years
 - 61-82% females
 - Thrombosis
-
- 4-30 days post AstraZeneca OR Johnson & Johnson/Janssen vaccine for COVID-19



Thrombotic syndromes

Venous Thrombosis

- Cerebral vein thrombosis
- Splanchnic vein thrombosis
 - Portal, hepatic, mesenteric
- Adrenal vein thrombosis
- PE/DVT
- Deep Vein Thrombosis

Arterial thrombosis

- MI
- CVA
- Acute limb ischemia

Disseminated intravascular coagulation

Greinacher, NEJM April 9, 2021

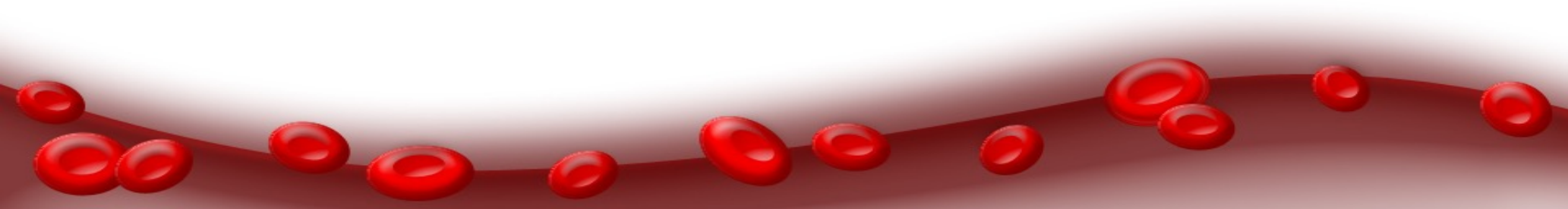
Schultz, NEJM April 9, 2021

Scully NEJM April 16, 2021



Laboratory abnormalities

- Platelets $< 150 \times 10^9/L$; **median ~20**; ~(range 7 to 113)
- Elevated d-dimer: Often $>10,000$
- Can also have:
 - Decreased fibrinogen
 - Elevated INR and PTT



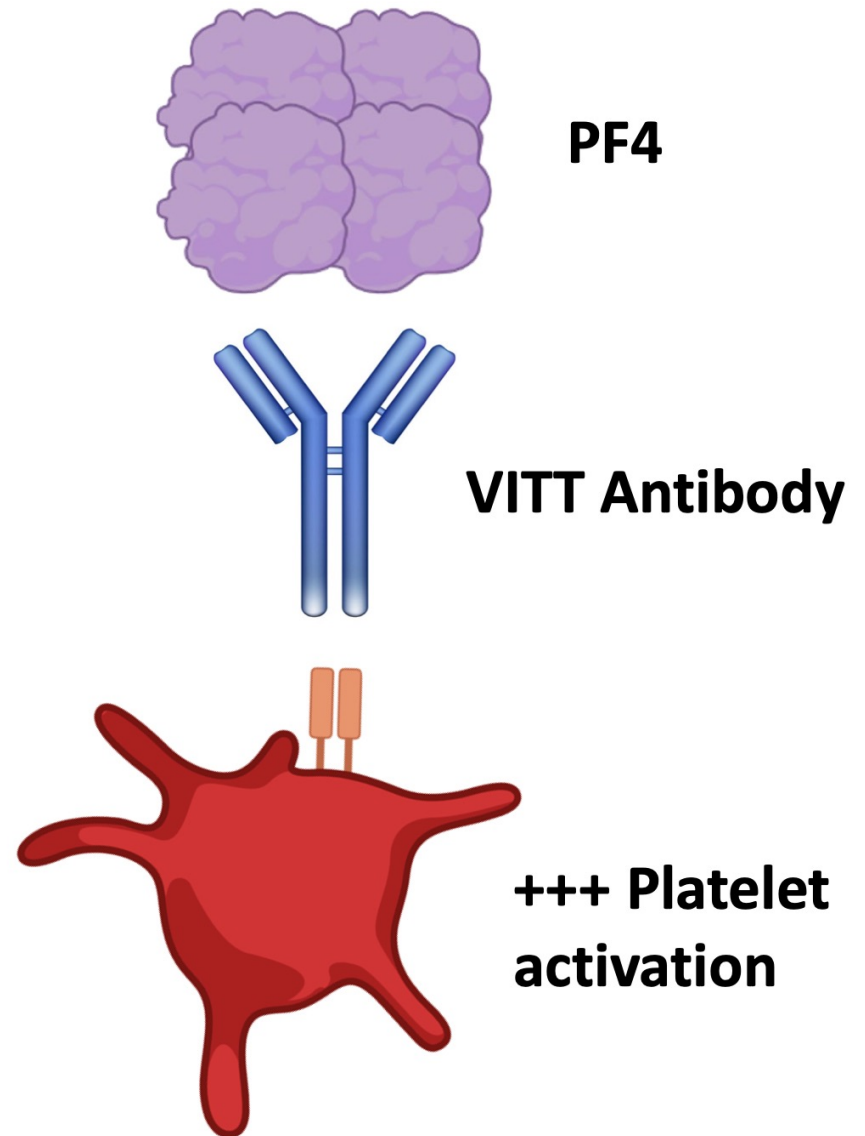
Incidence

- Exact incidence is unknown
- Appears to be around 1:50,000 to 1:100,000 doses
- Can occur after the 1st or 2nd dose of the AstraZeneca and Janssen/J&J adenoviral vector vaccines



Proposed Mechanism

- Immune reaction to the AZ/JJ vaccines
- Similar to HIT (but no heparin)
- Vaccine components/VITT antibody and PF4 complex bind to and activates platelets
- Results in thrombocytopenia & thrombosis



AstraZeneca in Manitoba

- As of May 12, 2021
 - ~77,000 first doses given to Manitoba
 - ~7,000 dose remaining
- 1 confirmed VITT (~5 suspected; waiting further results)
- 1 'confirmed' negative (*but we still wonder if this is VITT*)



When to think VITT

- Thrombosis
- Thrombocytopenia
- 5 to 30 days after a dose of AZ/JJ vaccine

- Example of presenting thrombotic symptoms
 - Persistent/severe headache
 - Focal neurological symptoms or visual changes
 - Shortness of breath
 - Abdominal or chest pain
 - Swelling and redness in a limb
 - Pallor and coldness in a limb
 - Unusual bleeding, multiple small bruises, reddish or purplish spots or blood blisters under the skin



Clinical suspicion

History of viral vector vaccine within 4 -30 days



Imaging confirmed thrombosis

- MR/CT **venogram** for cerebral sinus
- CT venogram for splanchnic vein thrombosis
- Other imaging as indicated



Thrombocytopenia (Platelet <150)

VITT specific Investigations

Involve hematology early
Confirm thrombocytopenia and assess for microangiopathy

Local D-dimer AND **McMaster VITT ELISA assay** +/- functional assay/SRA

- INR, PTT, fibrinogen

Treat as "presumptive VITT" while VITT assay pending IF

1. D-dimer > 1000 AND
2. No other DDx for low PLT

McMaster VITT assay POSITIVE

McMaster VITT assay NEGATIVE

Treat VTE as per usual using non-heparin anticoagulant

How we approach Treatment of "presumptive VITT"

Consult Hematology

1. Anticoagulation
 - **Avoid heparin, LMWH, warfarin and platelet transfusion**
 - If low risk of bleeding, use direct oral anticoagulant (apixaban, rivaroxaban at VTE dosing)
 - If high risk of bleeding, use parenteral anticoagulation (argatroban, bivalirudin or danaparoid if PTT prolonged at baseline)
2. IVIg 1g/kg daily for 2 days
3. Steroid if platelet count <50 (Prednisone 1mg/kg/day)
4. Others:
 - Consider inpatient monitoring if platelet <50 OR high risk of bleeding (e.g. CVT)
 - Consider fibrinogen replacement to keep fibrinogen >1.5
 - Plasmapheresis if persistent thrombocytopenia after IVIg/Steroid
5. Report to MB Health AND AVOID 2nd dose with viral vector COVID19 vaccine
Adverse Events Following Immunization Form

VITT Screening and confirmatory testing

- **Must collect sample PRIOR to IVIG/steroids** to avoid a false negative test
- Send the sample STAT to SGBH hematology lab for immediate processing (*sent to McMaster within 24 hours*)
- **Page the hematologist** on call to ensure the process is processed appropriately.



Uncertainties

- Who needs admission?
- How long to VITT antibodies last?
- Optimal diagnostic strategies?
- Risk adapted treatment strategies?
 - IVIG and steroid dosing
 - Use of immunosuppressives
 - Role of plasma exchange



Resources

- [Thrombosis Canada – VITT](#)
- [Vaccine-Induced Immune Thrombotic Thrombocytopenia: How it Happens and How to Spot It \(acforum.org\)](#)
- [PHAC – Thrombosis Canada Webinar on VITT | Thrombosis Canada – Thrombose Canada](#)

Questions:

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