Transfusion-associated circulatory overload (TACO)

Draft revised reporting criteria

International Society of Blood Transfusion

Working Party on Haemovigilance

in collaboration with

The International Haemovigilance Network

PUBLICLY POSTED DRAFT (ISBT, IHN, AABB websites) FOR COMMENT

These proposed surveillance reporting criteria represent a revision of the previous international TACO definition published by the International Society for Blood Transfusion Haemovigilance working party and International Haemovigilance Network:
http://www.isbtweb.org/fileadmin/user_upload/Proposed_definitions_2011_surveillance_non_infectious_adverse_reactions_haemovigilance_incl_TRALI_correction_2013.pdf

Please send any comments on this version to:

Kevin Land, ISBT haemovigilance working party chair (kland@bloodsystems.org) or
Jo Wiersum, TACO definition revision group (j.wiersum@tripnet.nl) before 31st January 2017.

The comments will be considered by the revision group prior to steps for validation of the criteria.

Rationale for the revision

At the Amsterdam meeting of the ISBT haemovigilance working party (2013), a number of members requested revision of the TACO definition. Notably, strict application of the definition leads to non-acceptance of cases which would be accepted as TACO by clinicians and by some haemovigilance systems.

A draft revised version was circulated in December 2014 and tested by contributors from haemovigilance systems in several countries and continents. This definition was found to be more inclusive than the 2011 version but limited by the weight placed on enlargement of the cardiac silhouette and increase of BNP – both are often not investigated or not recorded in haemovigilance reports.

The revision group recognises that the chief priority is to adopt agreed standard reporting criteria which will enable professionals to raise awareness of TACO and lead to improved reporting. This will open up possibilities for research and improvement of patient safety. In future, the criteria may need to be adjusted in the light of accumulating evidence.

The revision group (listed alphabetically)

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Transfusion-associated circulatory overload (TACO)

Proposed standard reporting criteria (2016)

Introduction

- The term transfusion-associated circulatory overload or TACO indicates that there is a *temporal* association (association in time) with blood transfusion. The imputability, the *causal* contribution of the transfusion, is assessed separately.
- Certain clinical conditions, e.g. cardiovascular, renal, pulmonary diseases and severe anemia, are risk factors for TACO.
- Other intravenous fluids given before or around the time of the transfusion contribute to and can exacerbate the fluid challenges posed by transfusion.
- Patients with TACO cardinally manifest respiratory system-related signs and symptoms such as tachypnea, dyspnea, and decreased oxygen saturations, typically occurring during or within 12 hours of transfusion.
- Close monitoring of the patient and the vital signs during transfusion are important; they also relate to any prior transfusions given in the previous 24 hours. An increase of blood pressure and tachycardia may be warning signs; appropriate clinical management may prevent development of TACO.
- Radiographic chest imaging of adequate quality at the time of the reaction is an important means of gaining diagnostic certainty and should be considered. However, cases without chest imaging may be reported as TACO providing other features are present.
- An increase of body temperature should be investigated according to protocol and clinical judgement. Increased body temperature does not exclude TACO if the reporting criteria are met. Patients receiving ventilatory support: **I**n ICU patients who may be receiving varying degrees of PEEP (positive end expiratory pressure) ventilatory support, pulmonary oedema may be difficult to diagnose at higher PEEP settings with TACO becoming apparent only if PEEP settings are reduced or ventilation is discontinued.

TACO reporting criteria

Patients classified with a **TACO (surveillance diagnosis)** should exhibit:

1) acute onset or worsening respiratory distress during or up to 12 hours after transfusion; *and*

2) two or more of the following:

- Evidence of acute or worsening pulmonary oedema based on:
  - clinical physical examination (see Note 1), *and/or*
  - radiographic chest imaging (see Note 2)
- Evidence for unanticipated cardiovascular system changes including development of tachycardia, hypertension, jugular venous distension and peripheral edema (see Note 3)

- Evidence of fluid overload including any of the following: a positive fluid balance; response to diuretic therapy combined with clinical improvement; and change in the patient's weight in the peri-transfusion period (see Note 4)
- Elevation in natriuretic peptide (NP) levels (e.g., BNP or NT-pro BNP) to greater than 1.5 times the pretransfusion value.
  A normal post-transfusion NP is not consistent with a diagnosis of TACO; serial testing of NP levels in the peri-transfusion period may be helpful in identifying TACO.

Notes

1. Clinical findings could include crackles on lung auscultation, orthopnea and cough, cyanosis and decreased oxygen saturation values in the absence of other specific causes.

2. Diagnostic radiographic Imaging

Findings consistent with circulatory overload could include presence of new or worsening pleural effusions, progressive lobar vessel enlargement, peribronchial cuffing, bilateral Kerley lines, alveolar oedema with nodular areas of increased opacity and cardiac silhouette enlargement.

3. Blood pressure monitoring

Often the arterial pressure is raised, often with widened pulse pressure; however hypotension may be a presenting feature, e.g. in patients in a state of acute cardiac collapse.

Blood pressure should be monitored especially if multi-unit transfusions are given.

4. Change in the patient's weight

Typically the patient's weight will increase. However there may be a decrease following diuretic therapy.

Imputability

The imputability, the *causal* contribution of the transfusion, is assessed separately.