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Transfusion-Related Acute Lung Injury (TRALI) - a Serious and Under-recognized Complication of Transfusion

Transfusion-Related Acute Lung Injury (TRALI) is a significant cause of acute fatal transfusion reaction. For those interested in more information about this important transfusion-related problem, the following references may be of interest. Please note that several CBBS members participated in the following JAMA and TRANSFUSION articles.

- **Letter of Oct., 2001 alerting physicians** to risk of TRALI from transfusion of plasma-containing blood products - Kathryn C. Zoon, PhD, Director of CBER/FDA
- Kopko PM, Marshall CS, MacKenzie MR, Holland PV, Popovsky MA. Transfusion-related acute lung injury report of a clinical **look-back investigation**. JAMA. 2002;287:1968-1971
- Kopko PM, Popovsky MA, MacKenzie MR, Paglieroni TG, Muto KN, Holland PV. **HLA class II antibodies** in transfusion-related acute lung injury. Transfusion 2001 Oct;41(10):1244-8
- Silliman CC et al. Plasma and lipids from stored platelets cause acute lung injury in an animal model. Transfusion, **May 2003**
- Davoren A et al. TRALI due to granulocyte-agglutinating human neutrophil antigen-3a (5b) alloantibodies in donor plasma: a report of 2 fatalities. Transfusion, **May 2003**.

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Upon reading the above, some e-network members had the following comments.

1. **The failure of hospitals to report 6 of 8 severe reactions identified during a lookback** (ref. #2 above) seems worthy of discussion in our forum. It would be of interest to see if similar experiences occur in TRALI lookback investigations at other institutions.
2. **A blood banker from the United Kingdom** wrote that there is an excellent chapter in this year's UK 'SHOT' report (April 10 2002, covering the 12-month period in 2000 - 2001) which also tabulates the underlying diagnosis and transfusion history, clinical and radiological features, and treatment outcome and donor serology on 8 women and 5 men aged 21 - 81, of whom 4 died. **Two of these fatal cases were thought very likely to have actually had TRALI.** In all, 3 cases were thought 'highly likely', 5 'probable', 2 'possible, and 3 'unlikely' to have had TRALI.

ADDENDA April 23, 2002

3. **A blood bank physician in Michigan** reports that it is nearly impossible for a "hospital" to report a case of TRALI if the nurses and clinicians don't report the event as a possible transfusion reaction to the blood bank staff. The nearly total lack of awareness of TRALI among clinicians may be changed by the JAMA article (see reference #2 above) and FDA alerts but those things have to be read and understood before there will be a change in practice. Most of the affected patients are quite ill at the time of the transfusion event and the symptoms are most often interpreted as resulting from the underlying illness rather than a result of the transfusion event. In the Michigan blood banker's hospital he reports having over 25,000 transfusion events per year so they rely on the nurses and clinicians to identify unusual events associated with transfusions. He says that he would be happy to provide a practicum to the California Blood Banker who doesn't understand how serious reactions might not get reported to the regional donor center.
4. **The California blood banker** responds: "As stated in In my comment ([#1 above](#)) I felt the failure of reporting was **"worthy of discussion** in our forum". It was important to hear from others, and the Michigan blood bank physician has certainly opened the door to understanding some of the reasons why this serious problem is not being reported. Since TRALI was first

reported by Popovsky and Moore in 1985 there have been 46 reports entered in MEDLINE, and numerous presentations at blood bank meetings. The JAMA report by Kopko et al. should be a wake-up call for blood bankers to assume greater responsibility to educate physicians and nurses about considering TRALI as a cause of acute respiratory distress in ALL patients receiving plasma-containing blood products."

ADDENDA April 24, 2002

5. **A blood bank physician in Minnesota** whose 'clinic' is well known reports that following the publication of their initial reports of TRALI cases in 1983 and 1985, it became well known among the Anesthesiology, Pulmonology, Intensive Care and Hematology Staff physicians that the responding blood banker has a strong interest in TRALI. Because of this he tends to get many calls from clinicians who think they might have such a case. He reports that he encourages colleagues to think of this diagnosis and welcomes their calls. However, during one specific period of time (12 months) he concluded that for every true TRALI diagnosed after lab investigation, there were 9 cases that turned out to be due to other factors, mostly volume overload. He adds that he has learned that "volume overload" is a diagnosis which is considered almost as pejorative and is resisted by many clinicians, especially those who are younger and less confident or experienced, such as residents, who often take umbrage at the notion that one might be casting aspersions on their clinical acumen if one tells them that their patient has been volume overloaded! The responding blood banker finds that the nurses' notes on 24hr intake and output are most informative relative to these cases. When a 90 yr. old little lady with pulmonary edema (and boot shaped cardiac outline on chest X-ray) loses 2000 ml. of urine over a few hours (and has been up to 2.5 liters in positive fluid balance) contemporaneously with a clearing of pulmonary infiltrates, one can usually make a strong case for not initiating a lengthy laboratory testing of recipient and donors. It is fascinating to the responding blood banker how often the suggestion of possible volume overload is initially resisted by the clinical service ,only for the subsequent clinical course to clearly indicate that this has been the problem. While often frustrated by the frequency with which the diagnosis eventually turns out not to be TRALI, the responding blood banker is reluctant to discourage the calls about possible cases because it is so important not to miss the real thing when it happens ! He reports being quite encouraged by the recent increase in the general level of interest in TRALI among the transfusion medicine community. He agrees with the hopeful comment from another correspondent that the recent JAMA paper (Kopko et al) may lead to a much needed increase in awareness among **clinicians**.
6. **Pat Kopko** (about whom the e-network forum has heard a lot lately) would like to weigh in on the TRALI discussion. Here is what Pat has to say. "The fact that 6 of the 8 serious reactions were completely missed is significant cause for concern. However, it is not entirely surprising. Over the course of the last couple of years I have given numerous CME lectures on TRALI. I have been concentrating on lecturing to critical care and anesthesia groups. Invariably, at the end of the lecture at least one or two physicians comes up to me and tells me "I had one of these cases. I had no idea what it was." Often they tell me the patient died. Because of these types of experiences and others we strongly suspected that TRALI was underdiagnosed, even before we performed the look-back. I think that transfusion medicine physicians are much more aware of the diagnosis than the average physician that orders the transfusion. They can only report a probable TRALI case to the blood center, if it is reported to them. One of our biggest goals in publishing in JAMA was to get the attention of the physicians who transfuse the blood. **I would strongly encourage transfusion service medical directors to bring TRALI to the attention of their transfusion committee and their medical staff.** One encouraging aspect is that since we began investigating TRALI, the number of cases reported to our blood center by our hospitals has increased dramatically.

ADDENDA May 10, 2002

7. **A blood banker in the United Kingdom** reports that platelet labs in the UK have been **screening their HPA-1(a-) donors for HLA/HPA antibody**, and those donors with such antibodies are being removed from the local apheresis panels. Although primarily aimed at protecting neonates, two such donors in the responding blood banker's center have caused either **TRALI** or a severe transfusion reaction respectively in adult recipients.

REACTIVATED April 29, 2003 (in response to two new articles in Transfusion, May 2003, cited above.

ADDENDA April 30, 2003

8. **A transfusion medicine physician in Detroit** comments that another method for educating clinicians about TRALI is to **publish articles & references in any newsletters or flyers** that the pathology department or blood bank might distribute. Her institution's monthly laboratory newsletter is **widely distributed via intranet and print formats to most clinicians**. Judging from comments received from many physicians, it is **widely read**. After publishing pieces on TRALI, she has had **similar feedback to what Dr. Kopko reported**, ie, "so that's what that reaction was!"

ADDENDA Mar. 19, 2008

9. **A colleague** points out that there is a **new Phase I accreditation requirement of the College of American Pathologists (CAP Inspection Checklist item TRM.42110** (effective 9/27/2007) that **requires a plan to reduce the occurrence of TRALI and to track its frequency**. The exact wording of the checklist item is as follows:

TRM.42110 - Is the laboratory developing a plan to reduce the risk of transfusion-related acute lung injury (TRALI)? NOTE: The laboratory should track the frequency of TRALI.

The complete checklist can be found [HERE](#).

The inquiring colleague **wonders how other transfusion services are planning to comply** with this new accreditation item. Specifically, she would like to know if any transfusion service is **including as part of the transfusion reaction investigation** the looking up results of patients who have been tested for **oxygen saturation, BNP, chest X-ray, etc.**, to screen for TRALI and/or Transfusion Associated Circulatory Overload (TACO)? Or are transfusion services **merely "educating" the physicians in their facilities** about the risks?

Please submit comments to the [e-Network Forum](#).

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Addenda: April 23, 24 & May 10, 2002; April 30, 2003; Mar. 19, 2008

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