

THE IMPORTANCE OF THE SAMPLING TIME AFTER THE PREPARATION OF PLATELET CONCENTRATES FOR THE DETECTION OF BACTERIAL CONTAMINATION

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Background: Bacterial contamination and subsequent bacterial growth in platelet concentrates (PCs) stored at 22°C remain the most common transfusion associated infections risk. Many transfusion services have introduced universal culturing of all PCs in an attempt to control this risk. The initial bacterial inoculums in the PCs are thought to be very low, and concern have been raised that false negative cultures might occur if samples are taken too early before bacterial growth have raised the initial contamination to detectable levels.

Aim: To study if sampling day 3 of storage can detect contamination that were undetectable in samples taken on the production day 16–26 hours post collection.

Methods: PCs were manufactured by pooling 4 ABO/RhD-matched buffy coats with 300 ml T-sol (Baxter Healthcare Corporation), centrifuged to recover the platelet rich plasma and leukocyte depleted by filtration. The PCs were stored on a rocking platform at 22°C for up to 7 days. A 10 ml sample was taken after completion of production 16h–26h post collection and again on the third day of storage (up to 4 days post collection) and incubated for 7 days or until alert signal, using the BacT/ALERT device (BioMerieux, France) and aerobic culture flasks. If a BacT/ALERT signal appeared, a bacterial culture was taken from the BacT/ALERT flask, the PC, and the four corresponding RBCs. The signal was considered confirmed positive if a bacteria could be cultured and identified in the corresponding PC. If the PC had been issued before the occurrence of a signal, the signal was considered confirmed positive if a bacteria could be cultured and identified from the BacT/ALERT flask.

Results: 37,094 PCs have been sampled on the day of production 16h–26h post collection (Table 1). 60 (0.16%) were confirmed contaminated. The BacT/ALERT signal occurred after the PC had been issued in 15 cases. There were no complications reported from these platelet concentrate recipients. The bacteria found were coagulase negative staphylococcus spp (48 cases), corynebacterium spp. (9 cases), bacillus cereus (2 cases), aerococcus viridans (1 case). The median time elapsed from inoculation to signal was 21h (range 18–36) in cases with staph. spp., and 70h (range 58–133) in cases with corynebact. spp. 15,471 PCs have additionally been sampled day 3 of storage (table 2). 19 (0.12%) were confirmed contaminated, 17 cases with staphylococcus spp. (giving signal 17h (range 10–34) after inoculation), and 2 cases with corynebacterium spp. (giving signal 58h and 166 h after inoculation). The BacT/ALERT signal occurred after the PC had been issued in 4 cases. There were no complications reported from these platelet concentrate recipients.

Conclusion: Cultures taken from the PCs on the production day (16h–26h post collection) disclosed bacterial contamination in 0.16% of the PCs. In addition 0.12% were disclosed as contaminated by a further sample taken day 3 of storage. If only one sample is taken from the PC, the sampling time should be postponed to the first post production day (32h–42h post collection) in order to reduce the rate of false negatives.

Table 1. Results from up front cultures (16–26 h post collection)

Nos. of PCs monitored (01/2002–12/2005)	Nos. with signal in BacT/ALERT	Nos. of confirmed contaminations	Nos. w. pos. culture in a corresp. RBCs	Nos. w. "sterile" RBCs	Nos. issued before BacT /ALERT gave signal
37,094	95	60 (0.16%)	11 (0.03%)	49 (0.13%)	15

Table 2. Results from cultures day 3 of storage (all were negative in up front cultures)

Nos. of PCs monitored (01/2004–12/2005)	Nos. with signal in BacT/ALERT	Nos. of confirmed contaminations	Nos. w. pos. culture in a corresp. RBC	Nos. w. "sterile" RBCs	Nos. issued before BacT /ALERT gave signal
15,471	27	19 (0.12%)	2 (.006%)	17 (0.11%)	4