**Table 3.** Comparison of sodium, potassium, calcium, chloride, LDH, glucose of overnight whole blood versus fresh blood [2].

| | Overnight storage | | Freshly prepared | | | p Value |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t test | |
| **$Na^+$** | | | | | | |
| Day 1 | 153.922 | 14.486 | 160.120 | 16.906 | -1.98 | 0.05 |
| Day 3 | 140.750 | 23.018 | 152.000 | 16.316 | -2.81 | 0.006 |
| Day 5 | 128.102 | 22.407 | 139.531 | 16.470 | -2.89 | 0.005 |
| ***$K^+$** | | | | | | |
| Day 1 | 6.805 | 1.555 | 6.710 | 1.340 | 0.330 | 0.742 |
| Day 3 | 6.399 | 1.656 | 6.451 | 1.318 | -0.175 | 0.862 |
| Day 5 | 6.808 | 6.750 | 5.691 | 1.243 | 1.14 | 0.251 |
| **$Ca^{2+}$** | | | | | | |
| Day 1 | 0.617 | 0.621 | 1.490 | 0.917 | -5.61 | <0.001 |
| Day 3 | 0.542 | 0.593 | 1.407 | 0.923 | -5.56 | <0.001 |
| Day 5 | 0.421 | 0.526 | 1.170 | 0.870 | -5.23 | <0.001 |
| **$Cl^-$** | | | | | | |
| Day 1 | 102.137 | 23.369 | 126.420 | 14.861 | -6.21 | <0.001 |
| Day 3 | 91.960 | 23.402 | 116.224 | 14.918 | -6.13 | <0.001 |
| Day 5 | 77.116 | 24.667 | 104.959 | 16.065 | -6.66 | <0.001 |
| **LDH** | | | | | | |
| Day 1 | 192.745 | 30.650 | 249.260 | 49.820 | -6.88 | <0.001 |
| Day 3 | 179.720 | 32.566 | 231.143 | 47.770 | -6.26 | <0.001 |
| Day 5 | 168.941 | 31.760 | 204.612 | 46.730 | -4.48 | <0.001 |
| **GLUCOSE** | | | | | | |
| Day 1 | 254.373 | 64.434 | 290.420 | 54.956 | -3.02 | 0.003 |
| Day 3 | 212.460 | 63.440 | 270.122 | 55.275 | -4.81 | <0.001 |
| Day 5 | 175.196 | 53.645 | 241.551 | 57.097 | -5.99 | <0.001 |

*There was substantial difference found statistically between overnight storage blood and freshly obtained in relation to Sodium, Calcium, Chloride, LDH, and Glucose at 1st day, day 3, and day 5*

**There were no substantial differences noted statistically found between overnight storage blood and freshly prepared with respect to potassium*

platelet counts showed a 33% greater concentration of platelets [6].

In other studies, active cooling devices were utilized for cooling of the blood to 20°C to 24°C after collection. In our study, we had not utilized active cooling devices can be the reason of having lower yield of platelet count. Few studies show the temperature control by active cooling devices may influence the count of platelets. Although platelet count in PCs unit processed from stored WB for 24 h period can be used for patients having thrombocytopenia. TRBC in this study was remarkably more on Day 1 from stored WB as compared to freshly obtained PCs. The PCs were being obtained from WB via soft-spin for separation of the RBC's from the PRP and high-spin for separating platelet from Platelet Poor Plasma (PPP). RBC's in PCs in our study is because of flow of scant quantity of RBC's in the PCs bag in processing during first separation process after the first spin (soft spin). In hard spin, red blood cells (residual cells) can sediment at the bottom with platelets because of the inappropriate separation of PRP from the red cells as the soft spin leads to the presence of residual red cells in PRP and subsequently there are existing residual red cells in the PCs. The TWBC results showed more TWBC on 1st Day in respect to PCs obtained from Stored WB as compared to the freshly obtained PCs. One of the studies reflected that milieu hold of WB has remarkably higher WBC count after a 12 h hold duration in comparison to 4-8 h hold period [5].

Different result was seen in study done by Dijkstra-Tiekstra et al. [1] which showed no notable differences for TWBC count in PCs obtained from overnight-held WB and the freshly prepared PCs. Few studies showed that overnight stored WB at RT may decrease the risk of bacterial contamination as the WBCs will phagocytose the bacteria [1,7].

Less amount of WBC in the PCs in overnight-held WB may decrease Cytomegalovirus risk transmission, HLA immunization, and febrile reactions [8].

In our study there was no substantial difference in relation to the pH on 1st day, 3rd day and 5th day after overnight storage. In other studies, there are significant differences in pH values, probably because consumption of glucose and formation of lactate by the RBCs in the stored WB. Although reduction in pH for PCs obtained from 24 h stored WB had been seen previously. Naturally there is more of lactate formation from glucose by RBC glycolysis in association with inconsiderable drop in pH in contrast to the WB units which are processed within 8 h [9].

Tiekstra et al. [1] states about variation in metabolism of pH, glucose, sodium had shown best results for freshly prepared PCs in comparison with overnight-held WB. If there is reduction in pH to levels around six (pH 6.0) in stored PCs in plasma results in considerable deprivation of the viability of the platelets. To ensure the platelets produced are viable, the platelets should not have acidic pH and the plasma volumes which have suspended platelets should be appropriate for keeping the pH neutral and it should permit for the gaseous exchange [10].

No bacterial growth observed in PCs in both categories of PCs in this study. *In vitro* studies done where there is inoculated PCs with bacteria advocated that a marked number of PC had prompt rise of bacterial growth on sixth and seventh storage day. Bacterially contaminated platelet component transfusion can lead to clinically significant events at 1 in 25,000 transfusions [11].

Other ways of contamination by bacteria in PCs can also result due to donor bacteraemia and during collection by the skin flora or while processing or during separation, seal leakage or collection bags having micro puncture. Preparation is done in closed and sterile system enables these studies to ensure a product with decreased bacterial contamination risk. In these other parameters such as pO2, $CHCO_3$ (P), Sodium, Potassium, Calcium, Chloride, LDH, and Glucose were analyzed. Platelets obtained from platelets from overnight held WB had more sodium, calcium, chloride, LDH, glucose in contrast to freshly obtained PCs. More studies are required to evaluate these parameters for more scientific research [2].

## CONCLUSION

PRP-obtained PCs from overnight WB have notable differences in vitro variables as compared to freshly processed WB. As a whole, this study set forth that the quality (*in vitro*) of PRP-obtained PCs, obtained from stored WB kept at RT is at minimum with the quality required of PCs for transfusion in patients having thrombocytopenia. There is sparse data available in vivo, but this also advocates that stored WB (for 24 h) is not disadvantageous for PCs quality. In upcoming research studies, functionality of platelets can be appraised on the PCs obtained from stored WB by performing functional status test of platelets. There is need of collecting more *in vivo* and *in vitro* data at the time of execution of overnight-held of WB during production of PRP-derived PCs. To conclude the choice of usage of overnight WB at room temperature must be inclusive of the plasma quality and RBC. Variables show wider standard deviation in our study, so more standardization is needed for PCs processing [11].

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