

Comparison Study of 70% Ethanol Effect on Direct and Retrival Culture of Contaminated Umbilical Cord Tissue for Expansion of Mesenchymal Stem Cells

Authors : Ganeshkumar, Ashika, Valavan, Ramesh, Thangam, Chirayu

Abstract : MSCs are found in much higher concentration in the Wharton's jelly compared to the umbilical cord blood, which is a rich source of hematopoietic stem cells. Umbilical cord tissue is collected at the time of birth; it is processed and stored in liquid nitrogen for future therapeutical purpose. The source of contamination might be either from vaginal tract of mother or from hospital environment or from personal handling during cord tissue sample collection. If the sample were contaminated, decontamination procedure will be done with 70% ethanol (1 minute) in order to avoid sample rejection. Ethanol is effective against a wide range of bacteria, protozoa and fungi and has low toxicity to humans. Among the 1954 samples taken for the study, 24 samples were found to be contaminated with microorganism. The organisms isolated from the positive samples were found to be *E. coli*, *Stenotrophomonas maltophilia*, *Pseudomonas aeruginosa*, *Enterococcus fecalis*, *Acinetobacter bowmani*, *Staphylococcus epidermidis*, *Enterobacter cloacae*, and *Proteus mirabilis*. Among these organisms 70% ethanol successfully eliminated *E. coli*, *Enterococcus fecalis*, *Acinetobacter bowmani*, *Staphylococcus epidermidis*, and *Proteus mirabilis*. 70% ethanol was unsuccessful in eliminating *Stenotrophomonas maltophilia*, *Pseudomonas aeruginosa*, and *Enterobacter cloacae*. *Stenotrophomonas maltophilia* and *Pseudomonas aeruginosa* have the ability to form biofilm that make them resistant to alcohol. Biofilm act as protective layer for bacteria and which protects them from host defense and antibiotic wash. Finally it was found 70% ethanol wash saved 58.3% cord tissue samples from rejection and it is ineffective against 41% of the samples. The contamination rate can be reduced by maintaining proper aseptic techniques during sample collection and processing.

Keywords : umbilical cord tissue, decontamination, 70% ethanol effectiveness, contamination

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