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TRANSPLANTATIONS OF STORED UMBILICAL CORD BLOOD FROM PRIVATE BLOOD BANKS: WORLDWIDE EXPERIENCE AND ANALYSIS OF 52 CASE REPORTS FROM 1993-2004

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Introduction

Since introduction of private umbilical cord blood banking in the early 1990s at least 52 transplantations of stored umbilical cord blood have been performed between 12/1993 and 09/2004 worldwide. In a review we analyze and summarize the worldwide experience so far.

Materials and Methods

Analysis of data bases, as well as Internet and Medline search for case reports of privately stored umbilical cord blood transplantations.

Results

From 12/1993 to 09/2004 52 case reports were found. The average recipient age was 6.1 (0.5-43.6) years, the gender distribution was even (25 male, 26 female, 1 unknown). HLA-status was 6/6 (n=25), <6/6 (n=6) and unknown (n=21). Average time of storage was 14.9 months (1-69) (n=51), blood volume 85.2 ml (14-168), with MNC 7.0 x 108 (1.1-15.1) (n=38) and CD34+ 4.27 x 106 (n=31). Autologe transplantation was performed in 6 patients (11.5%), in 45 on siblings (86.5%) and in 1 on a child's parent (1.9%). Whole blood was given in 10 cases (19.2%) and separated blood in 40 (76.9%). CB bank was located in the USA 48 times (92.3%) and in Singapore, Mexico, Canada and Brazil 1 each (1.9%). Indication for allogenic transplantation (n=46) were ALL (n=20), AML (n=6), CML (n=2), Fanconi anemia (n=4), sickle cell anemia and thalassemia (n=3) each, and 1 each of Blackfan Diamond anemia, chronic granulomatous disease, Hurler syndrome, MDS, severe aplastic anemia, Wiscott-Aldrich syndrome and x-linked hyper IgM syndrome. Indication for autologe transplantation (n=6) were severe sickle cell anemia (n=3), neuroblastoma IV (n=2) and retinoblastoma (n=1). Engraftment is documented as successful in at least 34 cases (65.4%), remains unknown in 17 (33.0%). 3 patients (5.8%) deceased.

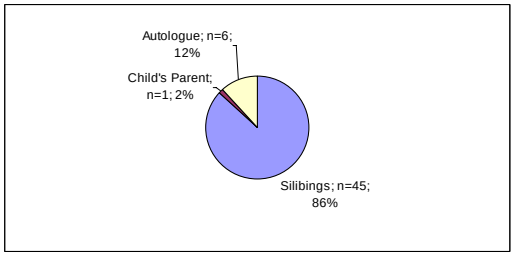

Fig. 1. CB transplantation recipients (n=52).

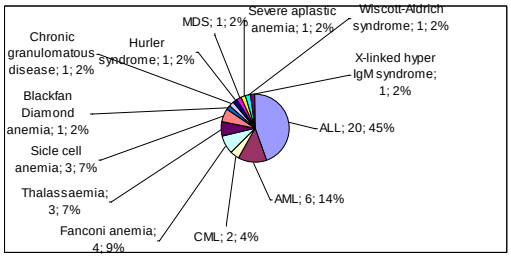

Fig. 2. Indication for transplantation.

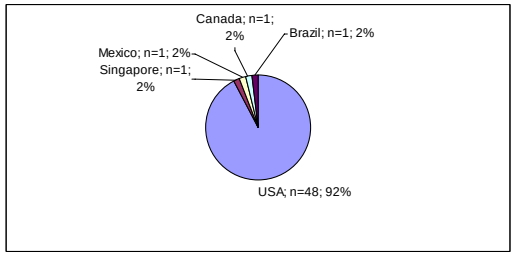

Fig. 3. Location of cord blood bank (n=52).

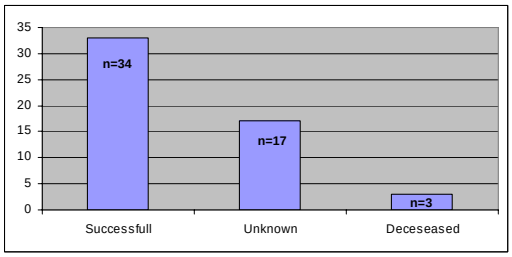

Fig. 4. Result of transplantation.

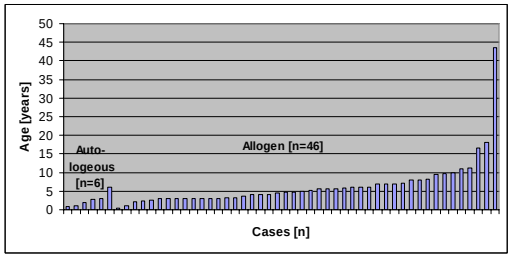

Fig. 5. Recipient age at transplantation (n=46).

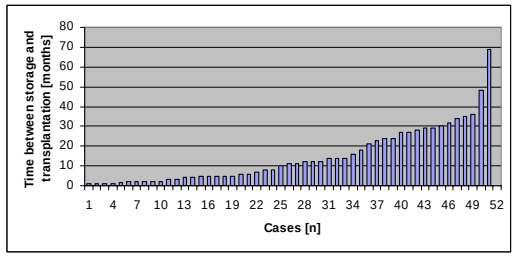

Fig. 6. Storage time before transplantation (n=51).

Discussion

This series of cord blood transplantations from private cord blood banks worldwide documents that its medical application is performed. Analysis shows a wide range of indications for cord blood transplantation. However, verification of medical indication could not be performed and long-term outcome is currently not available. Since 9/2004 several more cases have been published, also the first in Germany. Therefore private umbilical cord blood banking can be considered a method for individual health care prevention. To increase the use of private blood banking, future indications, e.g. in regenerative medicine or tissue engineering, have to be developed to convince society and health insurances of its intended purpose and to cover costs for their service.

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