

줄기세포 치료를 위한 제대혈의 이용

Use of Cord Blood Stem Cells in Cell Therapy

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Abstract

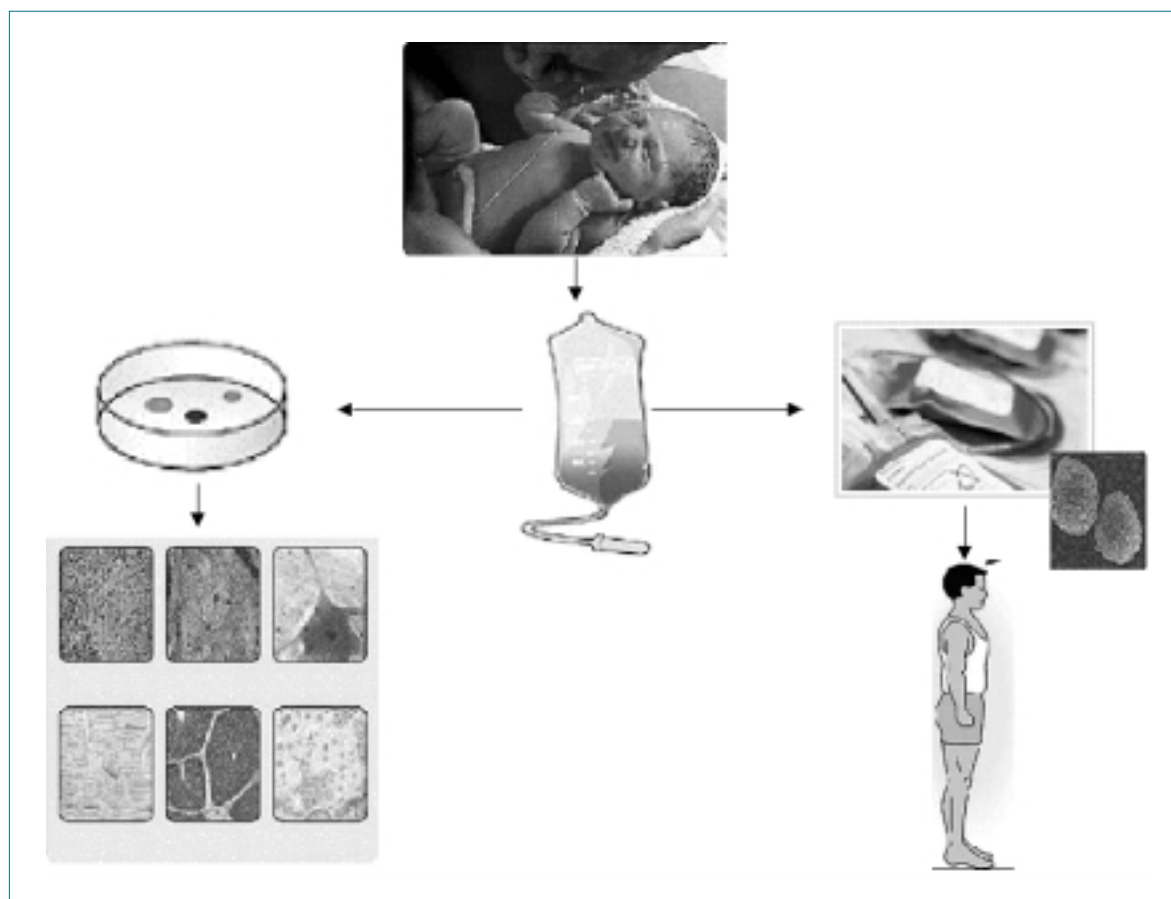
The possibility to use cord blood stem cells in clinical transplantations has been recently realized. Cord blood was introduced as an alternative source to hematopoietic tissue for allogeneic transplantation following the successful use of a cord blood transplant in a child with Fanconi anemia. So far, more than 5,000 umbilical cord blood (UCB) transplants have been performed worldwide. In Korea, 100 cases of cord blood transplantation have been done at 11 cord blood transplantation centers by November 2003. Another important field to explore is the capacity of stem cells in cord blood to differentiate into mesenchymal progenitor cells, which are capable of differentiating into cells of different connective tissue lineages such as bone, cartilage, and adipose tissues, and thus they are the best candidate for tissue engineering of musculoskeletal tissues. Although it is still controversial whether UCB contains mesenchymal stem cells, UCB can serve as an alternative source of mesenchymal stem cells to bone marrow and should not be regarded as a medical waste.

Keywords : Cord blood; Stem cell; Cell therapy

· ; ;

(, umbilical cord) 가

가
1cm, 50cm
(umbilical artery) (unbilical vein)
(hematopoietic stem cell)
가 가 (mesenchymal
stem cell)가
가
(1, 2).
가 ,
(graft
vs. host disease)



1.

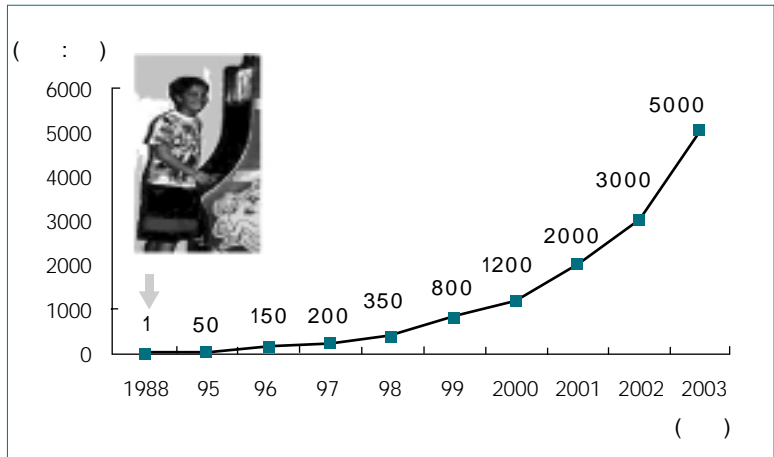
가 ,
가 ,
가

(3, 4).

60 ~ 150mL
가

(1).

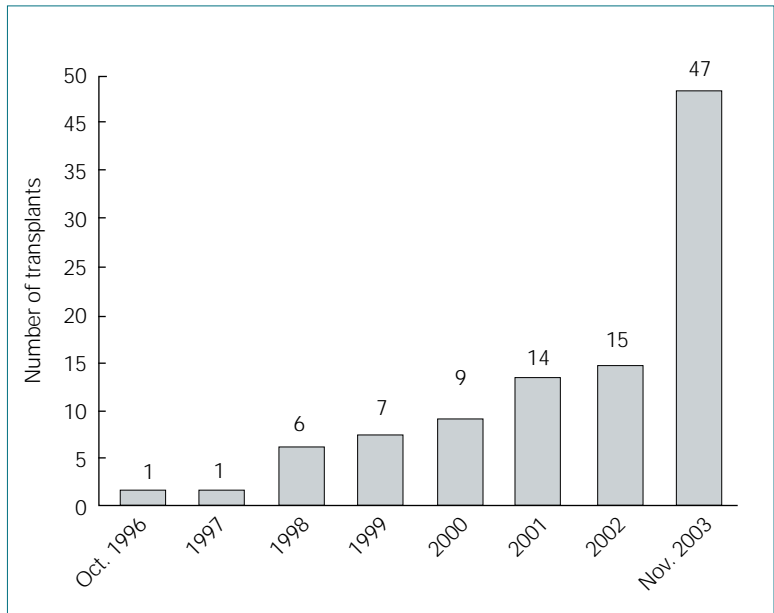
가



1988 Fanconi

23

2.



3.

가

(

) ,

(. 23)

()

가

1980

1988 Dr. Gluckman Faconi

(5).

1993

5,000 (2003

9 2,592 ,

1,505

1996 2004

5 1,667

)

(2)(6, 7).

2003

47

11

1996

100

35

46%,

(3)(8, 9). Cho(10) 8

, 2

1. HLA				(14)		
Type of stem cells	WBC recovery (day)	WBC Recovery (% by d 60)	Platelet Recovery (% by d 180)	Gr II-IV acute GVHD (by d 100)	Chronic GVHD (by 3 yrs)	Survival after 3 yrs
UCB (n=113)	26	89%	86%	14%	6%	64%
BM (n=2052)	18	98%	96%	24%	15%	66%

57%(P>0.2)

(75%) 가 , 1996

가 (15).

가 (11).

2 가 - 196 가

가 가 (12). 가

, , ,

가 3 가 64%, 66% ,

가

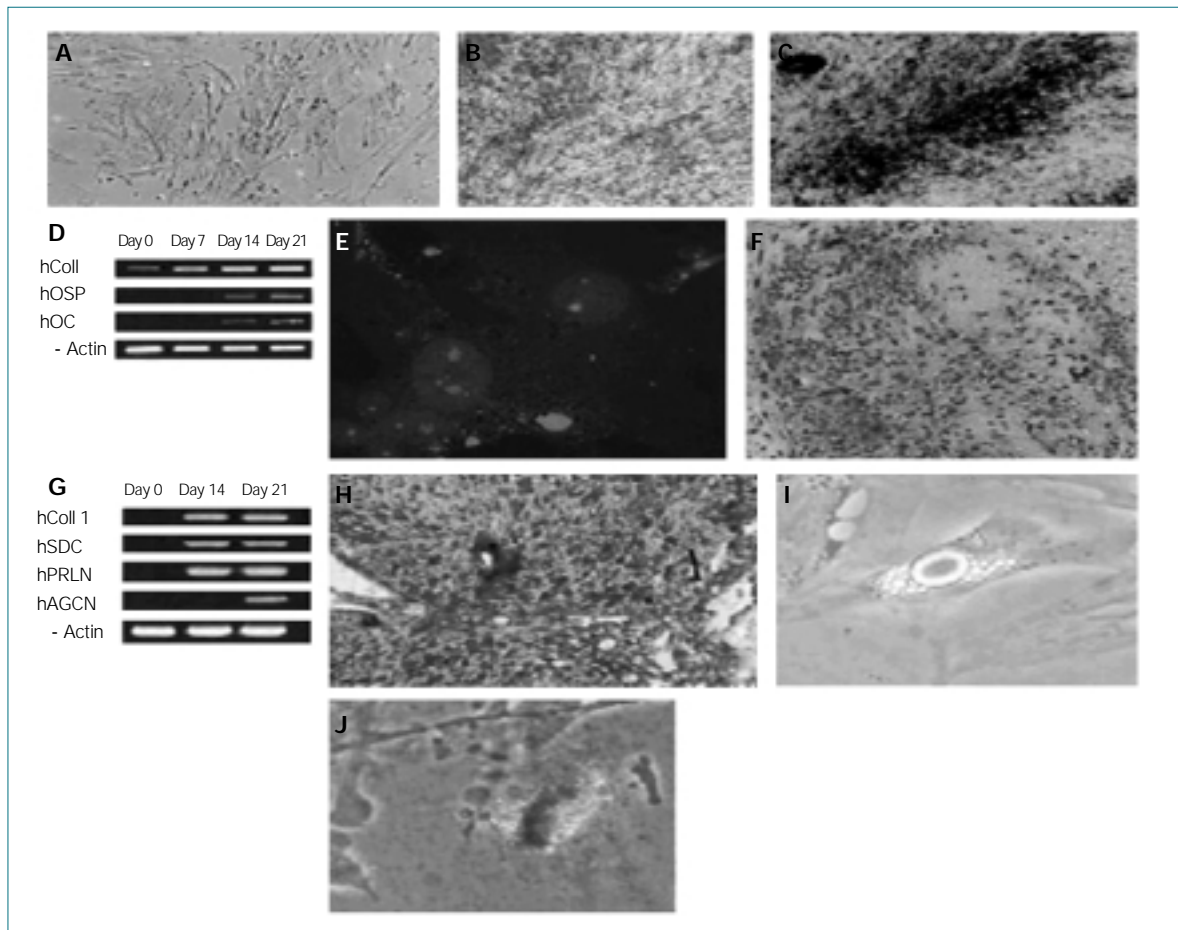
가 (1) (13, 14).

가가

HLA 0~2 HLA

가

(nonhematopoietic)



Magnification x 100, Lee Oscar K et al. Blood 2004 ; 103 : 1669 - 75

- A) 9
 B) Alizarin red mineralized matrix
 C) von Kossa staining
 D) (hColl, hOSP, hOC, 3)
 E) 21 osteopontin
 F) Safranin - O stain
 G) (hColl 1, hSDC, hPRLN, hAGCN)
 H) Type II collagen staining ()
 I) lipid vacuole
 J) Oil - red O

4.

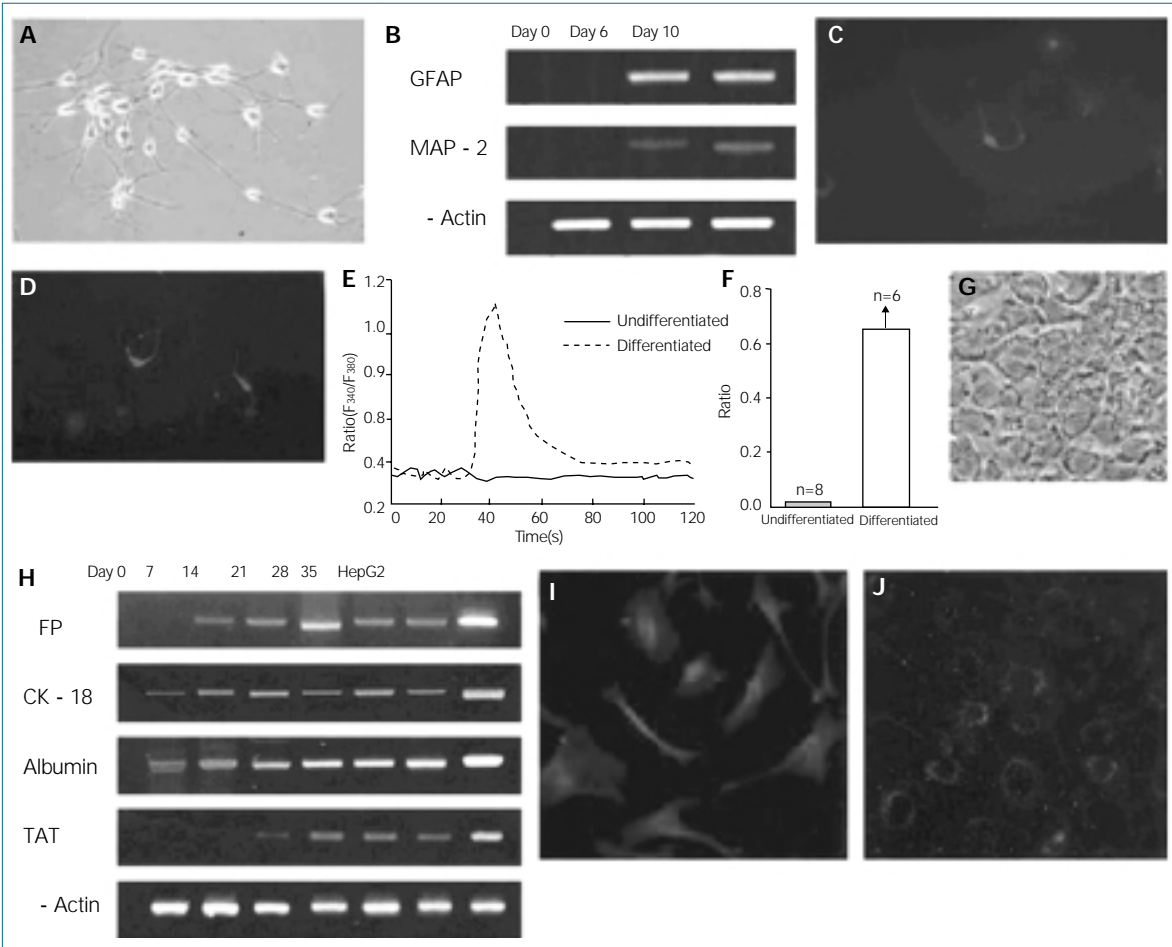
가 가
 가 (2, 16, 17). Erices (18)

Mareschi (19)

2000

. Goodwin (20)

가 , ,
 가 .



Magnification x 100, Lee Oscar K et al. Blood 2004 ; 103 : 1669 - 75

- A) (10) F) Ca⁺⁺ ratio of change
B) G) (Hepatocyte)
C) MAP - 2(Microtubule associate protein 2) H)
D) GFAP(Glial fibrillary acidic protein) I)
E) Calcium imaging assay J) LDL uptake

5.

2004 (mid - trimester fetal blood)
가 (21),
heterogenous cell

cloning (2).

가 .

가

.

CD34 SCF,
Flt - 3, TPO, IL - 3, IL - 6 가

.

(CD3+, CD14+, CD19+, CD38+,
CD66b+, glycophorin A+)
(negative purging) .

가 가

, ,

, (hepatocyte)

가 4 “ ” 가

5 (2).

.

가

가 .

가

(22 ~ 24). CD34

.

,

, HLA가 가

가 가 가

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