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Kinetics of Granulocyte Colony-Stimulating Factor in the Human Milk of a Nursing Donor Receiving Treatment for Mobilization of the Peripheral Blood Stem Cells

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Recombinant human granulocyte colony-stimulating factor (rhG-CSF) has been used for donors of peripheral blood stem cell transplantation (PBSCT) in order to mobilize hematopoietic stem cells. When a nursing woman is a PBSCT donor, rhG-CSF could be excreted into the human milk, and could affect her infant. How long G-CSF remains in maternal milk after the administration of rhG-CSF is still unknown. We recently examined the kinetics of the G-CSF in the human milk of a nursing woman serving as a donor for PBSCT, to determine when the G-CSF level returns to the basal concentration.

The donor was a 25-year-old healthy nursing woman who had given birth to her first child 2 months ago. To prepare for donating peripheral blood stem cells (PBSCs) to her mother with follicular lymphoma who was scheduled to receive PBSCT, the donor began to receive rhG-CSF (filgrastim) on August 14, 2005 (day 1). G-CSF was administered subcutaneously as follows: 600 μg on day 1, 300 μg × 2 on days 2–5, and 300 μg on day 6. The white blood cell count peaked (47.4 × 10^9/l) on day 6. PBSCs were harvested on days 4, 5 and 6. The total count of CD34+ cells harvested was 3.18 × 10^8. The only adverse event of G-CSF administration was bone pain, which began 2 days after the start of G-CSF treatment and disappeared 1 day after the last G-CSF treatment. No treatment was required for controlling the pain.

After having obtained written informed consent, the G-CSF levels in the human milk and peripheral blood were monitored. During the administration of G-CSF, each time the donor had a feeling of fullness in the breasts, the milk was expressed artificially using a milking device, and part of the gross quantities of human milk collected was used as a sample for measuring the G-CSF concentration. G-CSF levels were measured in the whole milk, not in the aqueous phase of milk by enzyme-linked immunosorbent assay. To monitor the serum G-CSF level, blood samplings were performed just before the first G-CSF administration once a day. As shown in figure 1, the serum G-CSF level, which was as high as 30,100 pg/ml 12 h after the start of G-CSF treatment, thereafter decreased rapidly despite continuing administration of the agent, and reached 306 pg/ml 24 h after the end of G-CSF treatment. The kinetics of serum G-CSF concentration were similar to the data reported by other researchers [1]. On the other hand, the G-CSF level in the human milk increased gradually and then slowly decreased: the level became detectable 12 h after the start of G-CSF administration, peaked (188 pg/ml) at 22 h, and thereafter decreased gradually and became below the detection limit (<10 pg/ml) of the assay 70 h after the end of treatment.

To date, there has been only one report on the G-CSF level in the human milk of a nursing woman who received

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