OBJECTIVE

To perform economic evaluation of breast milk (BM) (using clinical breast pump) or artificial formula (AF) for premature infants in the neonatal intensive care unit (NICU) for Russian healthcare setting.

METHODS

We calculated the cost of providing 100 ml of BM using clinical breast pump and 100 ml of AF for premature infants in the NICU. The total cost of providing BM was measured as: the breast pump cost, the individual pumping set cost and staff costs. The cost of providing AF was calculated using the mean cost per 100 ml for powdered AF and staff costs. We also calculated the cost per averted case of necrotizing enterocolitis (NE) for premature infant when breastfeeding instead of the AF is used. The cost of the averted NE was obtained using the difference in cost of feeding during the period, required for NE development and number of patients "needed to treat" (NNT) to prevent 1 NE case derived from the clinical trials. The average volume of milk, needed for premature infant’s feeding during 35 days was considered to be 14 liters of BM or AF (in accordance with the calculations of the average daily volume – 400ml). Besides we calculated the BM cost when breast milk fortifier (BMF) is added for low-weight infants.

RESULTS

The costs per 100 ml of AF and BM were similar (0.67 EUR and 0.77 EUR respectively) (figure 1), which is 0.39 EUR per day (2.7 EUR and 3.1 EUR respectively).

The largest share of the BM expenditure structure was taken by the individual pumping set cost – 0.62 EUR per 100 ml of milk. Expenditures on staff and the breast pump use were similar (0.08 and 0.07 EUR per 100 ml respectively). In the AF expenditure structure the largest share was taken by the AF cost (0.51 EUR per 100 ml). Staff costs were 0.16 EUR per 100 ml, that is twice higher than those for BM.

BM costs with the use of BMF were 3.56 per 100 ml. The difference in BMF and AF costs in this case was increased by 2.77 EUR and amounted to 2.87 EUR per 100 ml in favor of AF (figure 2).

In order to prevent one case of NE within 35 days, 25 premature infants must be fed with milk additionally. The difference in BMF and AF costs (per 14 L) in this case were 13.84 EUR: 94.42 EUR and 108.26 EUR for BM and AF, respectively. Eventually, the cost per averted case of NE was 344.5 EUR within 35 days that is less than NE treatment.

CONCLUSIONS

The cost of BM is comparable to the cost of AF, with a significant DBM clinical benefit. When calculating the costs of BM with the use of BMF, BM costs exceed those for AF for more than 5 times. The costs per averted NE within 35 days shows that BM is acceptable from the position of Russian health care system.