The economic benefits of providing human milk to preterm infants

Human milk not only prevents illness in the first year of life, it also offers considerable cost saving benefits to the NHS. Analysing data from over 50,000 infants, economists carried out an independent assessment of the value of human milk to preterm infants. This health economics analysis considers the financial implications of feeding breast milk to preterm infants.

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Key points

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1. This study considers the financial implications to the NHS of feeding breast milk to preterm infants.
2. The health economics analysis treats human milk as an intervention using existing evidence of its effectiveness.
3. Feeding preterm infants breast milk in the neonatal unit could save the NHS £30.1 million a year.

The health and economic benefits of providing human milk to term infants have long been established in medical literature, with evidence demonstrating that human milk can aid development and reduce risks of certain infections.[1] However, the health benefits of human milk to preterm infants – especially in the short-term before discharge from hospital – can be even more profound with significant reductions seen in both necrotising enterocolitis (NEC) and sepsis.[2]

Mothers of preterm infants (<37 weeks' gestation) face barriers to breastfeeding that are not normally encountered by mothers of term infants, which has led to the rate of exclusive breastfeeding at discharge for preterm infants to be as low as 29% in the UK.[3] To increase the uptake of human milk requires the alleviation of barriers through access to the right equipment, such as breast pumps, as well as appropriate support provided by clinical staff working in maternity units and neonatal intensive care units (NICUs). Both equipment and support need to be resourced so it is not only the health benefits of providing human milk to preterm infants that matter to decision makers but also how those benefits translate economically. This economic argument for providing human milk to preterm infants is absent in the literature. Commissioned by Medela, the York Health Economics Consortium (YHEC) at the University of York created a bespoke economic model to assess the value of human milk to preterm babies, the results of which have recently been published.[4]

An economic model of human milk as a medicine

In constructing an economic model, researchers at YHEC treated human milk just as they would a pharmaceutical product, constructing a model around a systematic review of the best available evidence on the potential health benefits from consumption of human milk for preterm babies in the NICU. Ideally, this evidence would come from double-blinded, placebo-controlled randomised trials (RCTs), however, such evidence is unlikely for human milk in preterm babies due to a range of practical and, more importantly, ethical issues.

The systematic review established the disease areas with the strongest sources of evidence of the short, medium and long-term benefits of human milk for preterm infants, as opposed to the use of formula feeds. With no RCTs, the data was selected based upon those with the largest sample sizes and with potential confounding factors isolated and accounted for by the authors. The health economic analysis assessed the economic impact of reducing rates of NEC, sepsis, sudden infant death syndrome (SIDS), leukaemia, otitis media, obesity and neurodevelopmental impairment. **FIGURE 1** shows the reduction in some of the complications that were identified from the systematic review and incorporated into the economic model.

Translating health benefits into economic value

In addition to reporting specific health outcomes, there are two ways that health economists aggregate health benefits into economic value.

The first is to add together all the costs associated with treating the various health outcomes and how frequently they occur. For example, the cost of treating a case of surgical NEC in the NICU to the NHS was

estimated by YHEC to be £18,877. There were an estimated 575 cases of surgical NEC in England and Wales in 2013;[5,6] if all preterm infants at that time were exclusively fed human milk, the model estimates that this would have reduced the number of cases of surgical NEC to just 79, saving the NHS £9.7m in treatment costs.

The same calculations were made for all of the health benefits and showed that if preterm infants could be exclusively fed human milk then the cost saving to the NICU would be £30.1m (£583 per infant) per annum. A conservative estimate of the savings post-discharge was an additional £16.1m.[4]

The second technique used by health economists to aggregate health benefits is to turn individual outcomes into quality-adjusted life years (QALYs). Simply put, the QALY is a measure of the value of health outcomes; a measure of both the quality and length of life a person experiences associated with a healthcare intervention. The National Institute of Health and Clinical Excellence (NICE), which advises on the use of health technologies within the NHS, is ordinarily willing to consider an intervention cost effective if the cost per QALY of an intervention is £20,000 or lower.[7]

By preventing death and disability, the YHEC model predicted a sizeable total QALY gain if the preterm babies born in 2013 were exclusively fed human milk in the NICU: 7,075 QALYs over their lifetimes. Given NICE value a QALY at £20,000, the total value of these QALYs to the NHS is £141.5m. Put another way, the NHS would be willing to pay up to £2,700 per preterm infant for an intervention that produced the same QALY gain.

The cost savings and value of the QALY gains predicted by the economic model for the 51,000 preterm babies born in England and Wales[8] in 2013 are summarised in **FIGURE 2.**

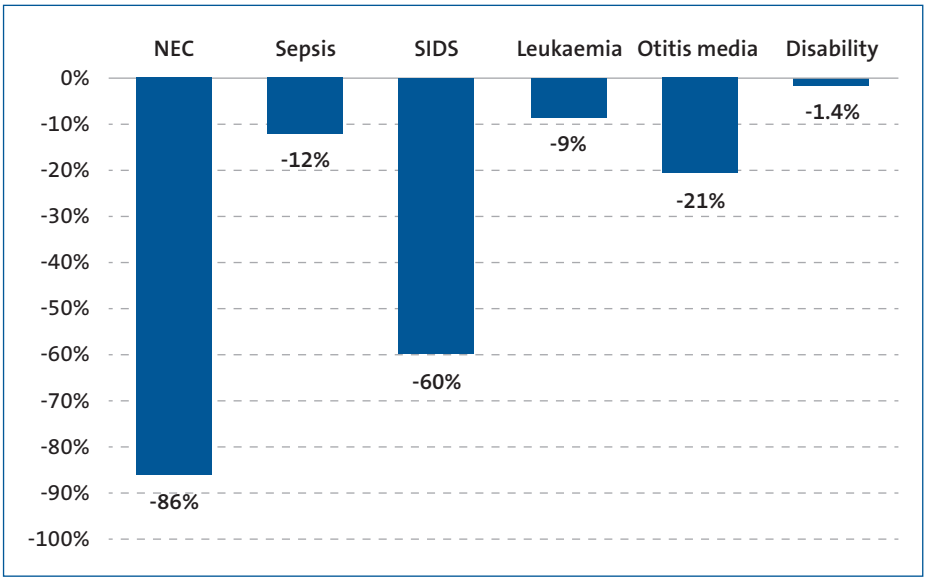

FIGURE 1 Risk reduction for complications through exclusive use of human milk compared to formula feeding in preterm infants.

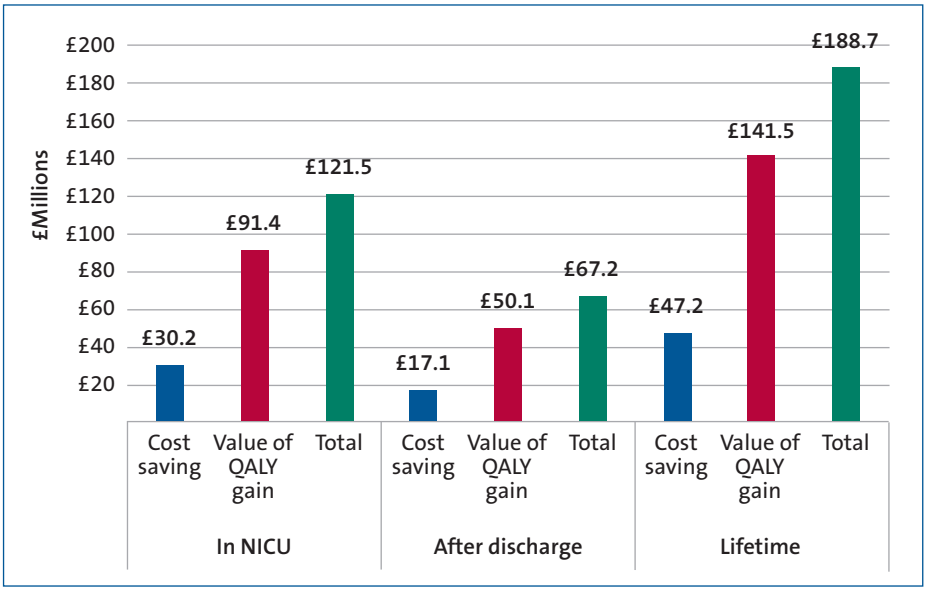

FIGURE 2 Cost savings and the value of QALY gains if all preterm infants both in England and Wales in 2013 were exclusively fed human milk.

A clear economic rationale for human milk in the NICU

The economic argument for encouraging and enabling human milk consumption is compelling. Human milk can save the lives of the most vulnerable of infants as well as increasing their long-term quality of life. It can save the health service some £580 per infant in costs while they are in the NICU alone. Even if there were no direct cost savings, based upon the health benefits it generates, NICE would be willing to pay up to £2,700 for each infant to receive human milk if it was treated like a pharmaceutical product. Yet only 29% of preterm infants in the UK have access to human milk. The fact that human milk is not a pharmaceutical product should not mean that the health service treats it any differently in terms of making choices on how to allocate resources, ensuring it is available to the infants that could benefit from it. The fact that NICUs would save a substantial amount of resource shows that to do otherwise is a poor allocation of resource within the health service.

Conclusion

This economic assessment calls upon the Government and NHS to integrate breast milk feeding into the standard healthcare cost model and to commit to supporting breast milk feeding for all babies born prematurely.

The economic model is universally relevant. It was applied first to the UK system, where quality standards are high and the national healthcare figures are thoroughly documented. Considering 10% of the global population is born prematurely, the logical next step would be to apply this model in other countries.

Declaration

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