
Executive summary

Health Council of the Netherlands. Neonatal screening for cystic fibrosis. The Hague: Health Council of the Netherlands, 2010; publication no. 2010/01.

The Health Council of the Netherlands has in 2005 provided the Minister for Health, Welfare and Sport with an Advisory Report on Neonatal Screening. In this advisory report, the Health Council highlights the advantages of neonatal screening for cystic fibrosis (CF), namely a better feeding status, prevention of an often protracted and aggravating diagnostic process and a decrease in the number of incidents of sickness and hospital admissions. Evaluations made of screening programmes performed abroad after 2005 have also demonstrated these advantages. However, the Health Council also underlined the imperfections of the screening methods available at the time, which was the basis for the recommendation to undertake research into better screening methods.

The CHOPIN study (Cystic fibrosis Heel prick screening in a newborn Population In the Netherlands) was undertaken in 2008 as a result of this recommendation. Based on the outcome of this study, the Health Council now concludes that an adequate method is available and – in view of the advantages of screening stated above – recommends to include cystic fibrosis in the neonatal screening programme. The recommended protocol comprises four steps, whereby each step is followed by a decision depending on preset criteria whether the next step will be performed or not. The successive steps are the determination of the immunoreactive trypsinogen concentration, the determination of the pancreatitis associated protein concentration, the analysis of 36 mutations in the cystic fibrosis transmembrane regulator gene which occur frequently in patients with cystic

fibrosis, and an extended analysis of mutations. Annex C provides a detailed description of the method. When two mutations associated with cystic fibrosis are found, newborns are referred to one of the centres specialising in cystic fibrosis in children, where teams composed of (paediatric) specialists, nurses, nutritional specialists, physiotherapists, social workers and others will provide optimal care. Parents of a newborn with CF, and parents whose child carries one mutation and therefore is a carrier of CF will be referred to a clinical geneticist for genetic counselling, the latter group unless they have indicated not to want to receive information about carriership.

The CHOPIN study included a limited number of patients, meaning that the probability of false-negative outcomes continues to be a concern (a false-negative result is obtained if the test indicates absence of disease whereas in fact the newborn has the disease). To prevent false-negative outcomes, it is therefore recommended for the time being to utilise a failsafe procedure described by the researchers. This procedure concerns additional mutation analyses if none of the 36 frequently occurring CF mutations is present, but a high concentration of immunoreactive trypsinogen is found.

In view of quality control the mutation analysis should be performed under the supervision of a centre for clinical genetics that is specialised in cystic fibrosis. The analysis should be evaluated systematically, and if necessary amended. As is customary in the current programme, patient registration is required for the valuation of the screening results, which is performed in the centres specialised in cystic fibrosis.

The CHOPIN researchers have estimated that the net annual costs of the full programme using the methods outlined above will be €140,000. The additional annual costs for the failsafe procedure are €39,000. The net costs of the full programme may be lower, however some aspects of the cost calculation are governed by uncertainty. If screening results in a decrease in treatment costs, it may even lead to a cost-saving on health care expenses.

The clinical course of newborns with forms of cystic fibrosis that are considered less severe should be monitored, as it is as yet unclear what treatments are optimal for the patients concerned. Neonatal screening will lead to the identification of a limited number of carriers of mutations, a finding that is relevant to the probability of eventual subsequent children developing cystic fibrosis. In the same way as in neonatal screening for sickle cell anaemia, parents should be given the option whether they wish to receive information about being carriers or

not. The committee takes the view that parents should not be informed about any findings unrelated to disease or that are not relevant in any other way. The importance of good information about the nature of the disease, the importance of an early diagnosis, the meaning of being a carrier (including the choice to either opt in or out of being informed) are emphasized by the committee. The information should also state that screening does not fully rule out the disease and only identifies a small proportion of carriers.