The evaluation of an intervention to prevent the early introduction of solids to babies

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Abstract

Aim: To report on the evaluation of a nutrition intervention that was designed to prevent the early introduction of solids to infants and to ensure food texture and variety were age appropriate.

Method: A "Nutrition Screening Tool", was administered to consecutive parents for three months by Maternal and Child Health nurses (MACH) at the two and six-month immunisation schedules. At the two-month immunisation, parents were asked to predict the age at which they proposed to introduce solids to their child and discuss the factors that influenced their decision making. At the six-month immunisation schedule, parents were asked to report the actual age at which they introduced solids to their child.

Results: More than 85% of parents reported that they actually, or intended to introduce solids after their baby is four months of age. There was no relationship between the age of introduction of solids and the source or number of information materials received or the birth order of the child (p>0.05).

Conclusion: Parents in the Australian Capital Territory (ACT) already have high rates of adherence to existing guidelines for the introduction of solid food to infants. The timing of a nutritional intervention to coincide with the six-month immunisation schedules was not optimal for this population.
**Introduction**

In Australia the National Health and Medical Research Council Guidelines (NHMRC) recommend that parents do not introduce solids to their baby until after the age of four months (National Health and Medical Research Council 1995). More recently, the World Health Organisation released a recommended exclusive breastfeeding to the age of 6 months to give the best nutritional start to infants (World Health Organisation 2001). Although this policy has not been adopted in Australia, it is a point of discussion in the review of the NHMRC Dietary Guidelines for Children and Adolescents (National Health and Medical Research Council 1995).

Despite the current recommendation to not introduce solids to infants prior to six months, recent Australian and international studies suggest that between 30% and 90% of parents introduce solids to their babies when they are younger than four months (Graham et al. 1998, Ford, Schluter & Mitchell 1995; Hornell, Hofvander & Kylberg 2001, Donath & Amir 2000). For instance, in a Melbourne based study, 29% of parents reported that they introduced solids to their infant by 3 months of age, and 67% had commenced solids between 4 and 6 months (Graham et al. 1998). Based on this Melbourne study result and anecdotal evidence, nurses and dietitians employed by the community health service in the Australian Capital Territory (ACT Community Care) perceived that there was scope for an intervention to improve feeding outcomes. At the time of commencing the study, there was no published literature on the age of introduction of solids to infants by ACT parents.

ACT Community Care dietitians and Maternal and Child Health (MACH) nurses developed a two-part Nutrition Screening Tool that could be administered opportunistically with the two and six-month immunisation schedules. The goals of the tools were to increase the age at which parents introduce solid food to babies and to ensure that the texture and variety of food being introduced were appropriate.

The attempt to introduce a nutritional intervention to coincide with the two and six-month immunisation schedules has not been documented previously. Approximately 80% of Australian babies are fully immunised at 12 months of age and Canberra has the highest rate of immunisation of any capital city (Glover, Watts & Tennant 1999). In the ACT, MACH nurses deliver 55% of childhood immunisation. Thus, immunisation creates an
ideal opportunity to provide information to parents on other early childhood health issues. This paper reports on the findings of the ACT pilot study and the implications for service delivery.

**Method:**

A two-stage approach was proposed to evaluate the Nutrition Screening Tool. Stage One involved the introduction of the Screening Tools in one of three health regions of the ACT to both pilot the screening tools and provide baseline data on the age of introduction of solids. The second stage was contingent on the findings in Stage One and involved the use of a regional control group to test the effectiveness of the tool at improving the key outcomes (the age of introduction of solids and the texture and variety of foods). The findings from Stage One meant that Stage Two of the evaluation did not go ahead.

The Nutrition Screening Tools were introduced in August, 2000 for a three month trial. All consecutive children presenting for the two or six-month immunisation schedule in the selected region were eligible to participate. An additional fifteen minutes was allocated to all appointments for two and six-month immunisation schedules to allow for the completion of the screening tools.

The two-month Nutrition Screening Tool was designed to guide the MACH nurse through a structured questionnaire regarding parental concerns and beliefs about the introduction of solids and familial risk factors for allergies. Additionally, the MACH nurse recorded the age at which parents anticipated introducing solids to their baby. In the six-month Screening Tool, the parent was asked whether they had introduced solids, the age at which solids were introduced, and to describe the actual diet of their baby. The child's diet was documented in table format on the Screening Tool. Parents were asked to list their sources of nutritional information and whether they had any feeding concerns. The information from both screening tools was used to guide nutritional information for the parent, and if necessary, the MACH nurse referred the parent to a dietitian.

Administrative staff recorded the names of children whose parent made an appointment to receive a six-week or six-month immunization schedule during the trial period. The MACH nurses completed the relevant screening tool, which remained in the client file. The files of eligible clients were subsequently audited to measure the rates of completion of the
nutrition screening tool, the actual and expected age of introduction of solids (as reported by the parents), the sources of nutrition information and the texture and variety of food. The MACH nurses provide qualitative feedback on the use of the tools through a focus group discussion.

**Results**

**Age of introduction of solids**

Figure 1 illustrates the actual and expected rates of completion of the nutrition screening tools at each immunization schedule. Of 278 appointments for immunization, 120 and 126 infants were scheduled to receive their two month and six month immunization respectively (the immunization age was missing from 32 client names). Files were available for audit in 258 (92%) of cases, and either of the screening tools were present in 167 (60%) of the files. At the completion of the trial, there were 90 completed two month and 77 completed six-month screening tools. The MACH nurses reported that the main reason the tool was not completed was lack of time, forgetting and in some cases, the additional 15 minutes had not been allocated to the appointment.

**Sources of nutritional information**

Parents received nutritional information from a variety of sources. On average, each parent who received any information (n=106) reported 2.9 sources of nutritional information. The sources of nutrition information for parents presenting for both the two and six-month immunization are summarised in Figure 3. The most commonly reported sources of
nutritional information were the MACH nurses and childcare books. Only five (5%) parents reported that they received nutritional information from a dietitian. Parents of two month old babies were more likely to report having received no nutritional information regarding the introduction of solids.

The actual or anticipated age of introduction of solids was not associated with the birth order of the child or the number of sources of parental nutritional information (p>0.05).

**Feedback from MACH nurses**

A focus group was used to elicit subjective feedback from MACH nurses on the use of the screening tools in October 2000, before the age of introduction of solids was known. Eleven (79%) of the fourteen MACH nurses participated in the focus group.

The MACH nurses reported that the use of the structured questionnaire was preferable to not using a structured tool because it provided a non-judgmental method of guiding parents through food choices for their child and that generally, parents enjoyed going through the screening tool with the nurse. The additional fifteen minutes was necessary to facilitate the completion of the tool.

The MACH nurses identified sleep as a major issue related to the food giving behaviour of parents. They perceived that many parents introduced solids early because they expected that it would help the child to sleep. The use of the screening tool facilitated the MACH nurses to discuss the feeding and sleeping routine of the child with the parent.

The reasons that the MACH nurses normally refer parents to dietitians include the identification of children with allergies (eg milk); constipated babies or when they perceive that the mother’s diet is inadequate.

Many parents had only recently introduced solids when their child presented for the six-month immunisation schedule which meant that it was often too early to determine the appropriateness of the texture and variety of the child’s diet. The nurses felt that it would be more suitable to undertake the second nutritional screen at 8 months so that the diet of the child could be determined. The nurses believed that more screening tools may be beneficial, for example 12 months, 18 months, 2 years and three years, continuing until the
child reaches school age. These screening tools could be used to identify attempts at behaviour modification by parents through the use of food and may have the potential to identify risk factors for obesity in children.

The MACH nurses reported a number of sources of confusion for parents over nutritional issues such as the brand named ‘Bounty Bags’ they receive from private hospitals that often have inappropriate labelling on baby food packaging and that GPs and paediatricians sometimes provide conflicting advice.

The broad aim of this project was to pilot the Nutrition Screening Tools. However, the pilot study of the tool demonstrated such a high rate of compliance with current feeding guidelines in the ACT that the routine use of the screening tool was considered to be an inappropriate use of resources. Instead, it was proposed that the screening tools would only be used when the MACH nurses believed that there was a potential risk of the early introduction of solids or allergies. Additionally the relatively late introduction of solids meant that it would be difficult to observe an improvement in outcomes across the target population, hence the decision not to proceed to the second stage of the evaluation. Some minor modifications were made to the screening tools as a result of feedback from the MACH nurses.

**Discussion**

Canberra parents have a high rate of adherence to the NHMRC guidelines on the age of introduction of solids for babies, both in terms of their actual and anticipated behaviour, with over 85% introducing solid food after the child is 4 months old.

A number of factors have been associated with the early introduction of solids or cessation of breastfeeding, including maternal smoking, lower educational achievement (Ford, Schluter & Mitchell 1995), a younger mother (Savage et al. 1998) and lower socio-economic status (Sikorski et al. 2001). Whilst this study did not capture socio-demographic data, according to the Index of Relative Socio-Economic Disadvantage, Canberra has the highest socio-economic status of any Australian capital city (Glover, Watts & Tennant 1999). Thus the late introduction of solids is not unexpected, however this does influence the generalisability of the results to regions of differing socio-economic status.
The region selected to perform this study is not significantly different from other Canberra regions in terms of relative socio-economic disadvantage, income or single parent families (Glover, Watts & Tennant 1999). The region has the highest proportion of 0-4 year old children in the ACT. It contains the statistical local area (SLA) with the lowest rate of immunisation in the ACT, at only 67% of children, although all other SLAs in the same region report immunisation rates greater than 85%. Lower rates of immunisation are weakly inversely associated with socio-economic status in the ACT (Glover, Watts & Tennant 1999). Thus, based on the results of other studies which link lower socio-economic status with the early introduction of solids, it is possible that the parents who do not immunise their children are also more likely to introduce solids early, negating some of the potential benefit of linking nutritional screening to immunisation schedules (Sikorski et al. 2001).

Another factor that limits the generalisability of this study was the 40% non-administration of the Nutrition Screening Tools for which the possibility of selection bias cannot be eliminated. The results are derived from parental self-report, preventing the ability of the MACH nurses to corroborate the results, although most other published studies also rely on self-reporting by parents.

The result of the pilot study has valuable implications for health service resources and planning. Whilst the two and six-month time frames appear to be opportunistic to help identify potential nutritional risks and inform parents, the six month assessment was not ideally timed to coincide with the nutritional needs of this population. The relatively late introduction of solids by many parents meant that at six months, the parents were still gradually introducing a range of flavours and textures to their baby. The MACH nurses felt that nutritional guidance would be more appropriate at 8 months. Other mechanisms may be more appropriate for to access those parents who do not immunise their children.
References


Tables and Figures

Figure 1: Actual and expected rates of completion of the nutrition screening tool

<table>
<thead>
<tr>
<th>EXPECTED</th>
<th>ACTUAL</th>
</tr>
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<tbody>
<tr>
<td>120 @ six week immunization</td>
<td>90 @ six week immunization</td>
</tr>
<tr>
<td>126 @ six month immunization</td>
<td>77 @ six month immunization</td>
</tr>
<tr>
<td>32 not stated</td>
<td>91 not completed</td>
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<td>278 children identified at intake</td>
<td>20 files not available</td>
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Figure 2: Proposed and actual age of introduction of solids

![Age of Introduction of Solids](image_url)

Age of Introduction of Solids

<table>
<thead>
<tr>
<th>Number</th>
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<tbody>
<tr>
<td>40</td>
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<td>20</td>
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<td>10</td>
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![Bar chart showing age of introduction of solids](image_url)

Age (months)
Figure 3: Sources of Nutritional Information for Parents who completed the Six-week and Six-month Screening tools

- MACH nurse
- Child care books
- Prev Kids
- Friends
- Other
- Milk to more
- Hospital
- Mother
- Magazine
- Bounty bag
- GP
- Child care centre
- Mother-in-law
- TV
- None
- Partner
- Paediatrician
- Pharmacy
- Dietitian

The chart shows the sources of nutritional information, with darker bars representing the six-month screening and lighter bars the six-week screening.