

Mothers' perceptions of their preterm infants treated in an incubator or on a heated water-filled mattress: a pilot study

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Sarman I, Tunell R, Västberg L, Carlquist U, Can G, Toparlak D. Mothers' perceptions of their preterm infants treated in an incubator or on a heated water-filled mattress: a pilot study. *Acta Paediatr* 1993;82:930-3. Stockholm. ISSN 0803-5253

Ten Swedish and 23 Turkish mothers delivering premature infants with a birth weight of less than 2000 g were investigated concerning their attitudes and feelings towards their newborn babies when the infants were treated either in an air-heated incubator or on a heated water-filled mattress (HWM). The first interview took place during the first few days after delivery and the second interview in the case of the Swedish study two weeks later and in the Turkish study one week later. In the first interview, feelings of fear, unreality and insecurity predominated, although significantly more so among the mothers of the incubator group. These feelings had changed strikingly by the time of the second interview among the mothers whose infants were treated on the HWM, but persisted to a large extent among the mothers whose infants remained in an incubator. The results of both investigations indicate that the mothers' perceptions of their infants improves when the prematurely born infant is treated on an HWM instead of in an incubator. □ *Incubator, preterm, thermal environment, mothers' reactions*

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Today, sophisticated and expensive skin servo-controlled (1) and double-walled (2) incubators and skin thermo-controlled radiant heaters (3) are the most used methods for providing warmth to preterm babies needing supplemental heat. It has been recognized that parents of infants treated in modern neonatal units in this thermal environment feel that the babies do not belong to them (4).

Skin-to-skin contact with the mother, "the Kangaroo method" (5) and the use of warm rooms (6) are methods in use in both developed and developing countries. Recently, an inexpensive apparatus for the provision of warmth has been produced and assessed (the thermo-controlled, heated, water-filled mattress, HWM). With this device, the parents' access to their infants is far easier than it is with the use of incubators, and the thermal effect has been shown to be equal to that of an incubator (7-10).

The aim of the present investigation was to study whether there is a difference in the mothers' perceptions of contact with their newborn premature infants when they were treated in the incubator versus when treated on the HWM.

Patients and methods

The first study. Ten Swedish mothers who had a premature delivery during 1985 at Huddinge Hospital in Stockholm were included in the study. Some clinical

data are given in Table 1. All the babies were healthy and were cared for by professional nurses in the neonatal care unit (NCU). The parents had free visits to the NCU. After birth, all infants were cared for in a single-walled, manually controlled, air-heated incubator (AGA MK41, Lidingö, Sweden). A first interview was performed during this stabilization period when the infants were in the incubator. The babies were then randomly allocated either to a study group which was cot-nursed on the HWM (KanMed AB, Stockholm, Sweden) (n = 5), or to a control group, which was kept in the same incubator during the whole study period (n = 5). The second interview occurred two weeks later. A semi-structured interview model was used on those occasions. The theme of the questions was to explore the mother's reactions to the crisis, their feelings of separation and the relation between mother and infant. A summary of the items of information in questions asked is given in Table 2.

The second study. The second study was performed in Turkey. During the study, February 1986 through March 1987, 23 infants with a birth weight between 1000 and 2000 g were included in the study. Some clinical data are presented in Table 1. On admission, they were randomly assigned for treatment either in a single-walled, manually controlled, air-heated incubator (Dräger-6000, Germany and Vickers-Medical 59, USA) or on an HWM. No infant had a major clinical problem and they all survived. The infants were cared

Table 1. Characteristics of mother-infant pairs. Values are mean \pm SD or number.

	Stockholm study		Istanbul study	
	Inc	HWM	Inc	HWM
Mothers				
Number	5	5	10	13
Age (years)	27 \pm 3.8	25 \pm 3.3	26 \pm 4.2	24 \pm 5.2
Primipara	2	4	2	5
Vertex versus cesarean	1/4	2/3	10/0	12/1
School education (years) ^a			7.3 \pm 4.2	7.5 \pm 2.7
Illiterate	—	—	1	0
5 years	—	—	4	6
8 years	—	—	2	3
11 years	—	—	2	4
University	—	—	1	0
Infants				
Number	5	5	10	13
Sex (M/F)	2/3	4/1	6/4	6/7
Gestational age (weeks)	31.2 \pm 2.6	32.4 \pm 1.7	32.5 \pm 2.0	31.9 \pm 2.1
Birth weight (g)	1540 \pm 266	1564 \pm 210	1559 \pm 310	1488 \pm 224
Age at first interview (days)	5 \pm 1.8	3 \pm 1.8	3 \pm 1.0	2 \pm 0.9
Total stay in NCU (days)	39 \pm 10.1	36 \pm 8.6	16 \pm 9.2	19 \pm 9.0

Inc = Incubator care; HWM = care on heated water-filled mattress.

^a Swedish mothers were not asked this question. A minimum of nine years' education in school is required in Sweden.

for by the mother or her relative, who was continuously present at the NCU. The first interview took place a few days after admission and the second one week later at the NCU.

A structured interview model using the same questions was used on both occasions. The theme in the interviews was the mothers' perceptions of their infants' condition and their experiences with the equipment with which the baby was treated (Table 3).

Table 2. Information obtained during interview recordings in the Stockholm study.

First interview	
Experiences	
During the pregnancy	
During the delivery	
Of having a previous child	
Of having a previous premature child	
Senses of guilt	
For the premature delivery	
Thoughts and feelings	
About the baby being cared for in the incubator	
Experiences	
Of first physical contact	
Of how the relation to the infant is beginning to develop	
Second interview	
Experiences	
Of the visits to the NCU	
Of washing, feeding the baby at the NCU	
Of leaving the baby at the end of the visit	
Of how the relation to the infant is beginning to develop	
Of anxiety on leaving the infant	

Data analysis

The results of the interviews were interpreted by UC and by DT respectively. Statistical analyses were evaluated with the Fischer exact probability test (11) using a *p*-value of less than 0.05 as significant. No interindividual reliability test was used during the interpretations of the interviews, but the mothers' statements are partly reported in the text. The study was approved by the local committee of ethics.

Results

The Swedish study

First interview. At the first interview, all the mothers felt fear and insecurity. They all spoke of a sense of unreality, as if they had not yet had a baby! They also had conflicting feelings. They realized rationally, that it was best for their child to be in the incubator, but they longed for close physical contact with it. Only two mothers at this stage expressed feeling that the infant was theirs. They all found it tiresome and unpleasant to sit and watch their baby in the incubator. It was easier when the baby had its eyes open.

No mother spoke about the babies spontaneously, but rather about the delivery and the problems that bothered them at the moment.

Examples of statements made by mothers in the first interview during incubator care: "It's like just anyone's

Table 3. Questionnaire and results (*n*) of the Istanbul study during the first (I) and second (II) interviews concerning the mothers' thoughts and feelings.

		Incubator		HWM		<i>p</i>	
		I	II	I	II	I	II
1.	How do you feel about yourself now?						
	(a) well	2	6	6	12		
	(b) not well	8	4	7	1	ns	ns
2.	What do you think about your infant's condition?						
	(a) he/she seems to be healthy or vigorous	0	1	1	8		
	(b) he/she seems to be weak or sick	10	9	12	5	ns	*
3.	How do you feel about the device that is being used to keep your infant warm?						
	—Well-being						
	(a) he/she seems to be thriving well	0	0	5	11		
	(b) he/she doesn't seem to be thriving well	10	10	8	2	*	***
	—Access to the infant						
	(a) easy	1	2	12	13		
	(b) difficult	9	8	1	0	***	***

HWM = Heated water-filled mattress. ns = Not significant; * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

child": "I don't feel it's my child": "It's hard to believe that the baby feels any difference when I pat it or when some nurse there pats it": "Get rid of that incubator so I can hold my baby!": "I don't think I have any right to him yet".

Second interview. One child in the incubator group was moved to an ordinary cot before the interview and the result of the second interview with this mother is not included. Two mothers felt ambivalence about leaving the baby alone and going home, but two had no such feelings. Three mothers had no feelings of contact with their baby and the phase of unreality and insecurity was still continuing: "I feel no real contact - putting in my two hands is no contact!": "It feels like the hospital's child".

In the HWM group the mothers stayed from morning to afternoon and regularly fed their infant. All mothers said that they now felt the baby was their own. All but one said that the incubator care had been frightening, the anxiety only disappearing when their babies were treated on the HWM. They all said that their relation to the baby was more natural and that they felt a closeness even when their baby was sleeping on the HWM. All mothers expressed a sense of emptiness and loneliness when it was time for them to go home in the evening. One mother wished to continue to care for her baby at home on the HWM.

Examples of statements made by mothers in the interview during HWM care: "It feels better now that she's been moved to the warm mattress": "It's much nicer now to see him lying on the warm mattress, he seems very happy there, never cries": "I can touch her in another way, look at her in another way": "He seems to enjoy it a lot, never cries".

The Turkish study

First interview. Eight mothers had feelings of fear mainly concerning the baby's survival. All mothers who had their babies in the incubator felt that their baby looked sick and fragile. No mother believed that their infant thrived in the incubator. Nine of 10 mothers in this group found physical difficulty in taking care of the infant in the incubator.

In the HWM group, 6 of 13 mothers expressed feelings of well-being during the first interview. All but one mother believed that the infants looked sick or fragile. Five of 13 mothers believed that the babies were thriving on the HWM, a significant difference from the incubator group ($p \leq 0.05$). The experience of physical difficulty in taking care of the infant was found in one of 13 mothers ($p \leq 0.01$).

Second interview. The results of the first and second interviews are given in Table 3. In the HWM group 12 mothers felt well and expressed no pain or fear and 8 mothers believed that their infants now seemed to be healthy. This differs significantly from the incubator group ($p \leq 0.05$). Eleven mothers emotionally accepted the HWM and no mother had any physical difficulty in taking care of her baby at this stage ($p \leq 0.001$). The majority of the mothers in the incubator group were not relaxed during their stay at the NCU: they felt that they should be looking after the baby all the time. This feeling was present in only 5 of 13 mothers in the HWM group, while 8 mothers seemed to be relaxed during their stay at the NCU. This difference was statistically not significant. Most mothers in the HWM group experienced a feeling that the baby was their own, but most mothers in the incubator group expressed anxiety about the future ($p \leq 0.05$).

Examples of remarks made by mothers of incubator babies: "I felt so afraid. Didn't dare to touch her"; "The incubator prevents me from coming near my baby"; "I'd like to hold the baby at my breast to feed it"; "... the baby would never come out of the incubator"; "... no one thought she would survive"; "... the baby seems so alone in there. If he were in my arms he could smell my body"; "I don't feel that he'll survive".

Remarks from mothers of HWM babies: "The warm mattress feels as warm as the womb"; "I feel that the baby is in my arms when she's lying on the warm mattress"; "... the baby holds my finger when she eats"; "The child on the warm mattress seems bigger and healthier".

Discussion

If parents do not understand the premature baby's special needs there is a risk of having difficulties in breast feeding (13) and in later suboptimal care with an increased risk of failure to thrive and of child abuse later in childhood (12).

The results of the present study regarding the mothers' perceptions of their infant's condition in the incubators show similarities with other studies regarding the consequences of early separation of the mother from her infant (14, 15). Both the Swedish and the Turkish mothers felt that the babies treated on the HWM were healthier and more vigorous than those treated in the incubator. They also felt that the babies belonged to them. There is evidence from other studies that mothers of infants who were ill felt themselves less important and had difficulties in relating to the infant (13). Incubators create a physical obstacle between the mother and her baby. They are technically advanced devices operated by professional nurses which keep the mother in an "inferior" position (16). The activity of mothers during the visits and their feelings towards the infants developed strikingly in the HWM group when the infants were moved from the incubator. The sense of unreality and insecurity disappeared among both the Swedish and the Turkish mothers.

The method of keeping newborn babies in skin-to-skin contact with their mothers ("Kangaroo") has also been applied with success in the care of premature infants (17, 18). During the present study the "Kangaroo" method was not used in the units. This gave us the opportunity to compare the mothers' perceptions of their infants purely when the babies were treated on the HWM compared to when they were treated in the incubator. Since then mothers are encouraged to have skin-to-skin contact with their premature babies during treatment both in the incubator and on an HWM.

The results of the present study are of importance since there were great differences in the mother's backgrounds, pregnancies and deliveries in the two

countries. Relations with the staff and the methods of taking care of the baby were different at the two units. Nevertheless, the mothers' perceptions of their infants were more positive when the babies were treated on the HWM than when they were treated in the incubator. HWM care in the premature nurseries implies an important improvement in parents' relations with their infants. It thereby shortens treatment time in the incubator and provides an alternative to the skin-to-skin "Kangaroo" method.

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Received Apr. 27, 1992. Accepted Apr. 28, 1993