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**Knowledge, attitudes and beliefs of health care workers regarding alternatives  
to prolonged breastfeeding, ANRS 1201/1202 Ditrane Plus, Abidjan, Côte d'Ivoire**

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Running head: Health providers attitude toward alternatives to prolonged breastfeeding

## **APPENDIX**

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### **Ethical permissions**

The ANRS 1201/1202 Ditrame Plus study was granted ethical permission in Côte d'Ivoire from the ethical committee of the National AIDS Control Programme, and in France from the institutional review board of the ANRS.

### **Composition of the ANRS 1201/1202 Ditrame Plus Study Group**

Principal Investigators: François Dabis, Valériane Leroy, Marguerite Timite-Konan, Christiane Welffens-Ekra. Coordination in Abidjan: Laurence Bequet, Didier K. Ekouévi, Besigin Tonwe-Gold, Ida Viho. Methodology, biostatistics and data management: Gérard Allou, Renaud Becquet, Katia Castetbon, Laurence Dequae-Merchadou, Charlotte Sakarovitch, Dominique Touchard. Clinical team: Clarisse Amani-Bosse, Ignace Ayekoe, Gédéon Bédikou, Nacoumba Coulibaly, Christine Danel, Patricia Fassinou, Apollinaire Horo, Ruffin Likikouët, Hassan Toure. Laboratory team: André Inwoley, François Rouet, Ramata Touré. Psycho-social team: Hortense Aka-Dago, Hermann Brou, Annabel Desgrées-du-Loû, Alphonse Sihé, Benjamin Zanou. Scientific Committee: Stéphane Blanche, Jean-François Delfraissy, Philippe Lepage, Laurent Mandelbrot, Christine Rouzioux, Roger Salamon.

**ABSTRACT**

The Ditrane Plus project conducted in Abidjan, Côte d'Ivoire is aimed at the prevention of mother-to-child transmission of HIV in combining perinatal antiretroviral interventions with a systematic proposal of alternatives to prolonged breastfeeding: formula-feeding from birth, or exclusive breastfeeding during three months then early cessation of breastfeeding. We surveyed all health care workers involved in this project in November 2003 using a self-administered anonymous questionnaire to investigate their knowledge, attitudes and beliefs regarding the infant feeding interventions proposed since March 2001. Their knowledge regarding infant practices proposed within the study was consistent and their attitude was in accordance with the study protocol. However, proposing alternatives to prolonged breastfeeding induces difficulties to health-care workers that should be taken into account when tailoring such complex interventions.

**Keywords:** HIV, mother-to-child transmission, infant feeding, health care worker, Africa

## **INTRODUCTION**

Mother-to-child transmission of HIV is a major public health problem in Sub-Saharan Africa where 55% of HIV infected adults are women, all of child-bearing age <sup>1</sup>. In these settings, predominant and prolonged breastfeeding is widely practiced (WHO infant feeding definitions are detailed in table 1), and is responsible for at least one third of peri nataly acquired HIV infections <sup>2</sup>. This post natal HIV transmission risk reduces considerably the effect of peri-partum antiretroviral interventions aimed at the prevention of mother-to-child transmission of HIV (PMTCT) <sup>3</sup>. Several alternatives to prolonged breastfeeding lowering the risk of breastmilk HIV transmission are conceivable and are currently evaluated within several research projects <sup>4</sup>. The evaluation of these post natal nutritional interventions is complex and includes the assessment of their uptake i.e. the prenatal acceptability by pregnant women and the long-term compliance after birth. Yet, the assessment of this uptake could be impaired by the way health care workers actually give advice on infant feeding practices <sup>5</sup>. The aim of this study was to investigate within a PMTCT project in Abidjan, Côte d'Ivoire, knowledge of health-care workers concerning infant feeding practices, and their attitude and beliefs regarding the alternatives to prolonged and predominant breastfeeding proposed within this project.

## **SUBJECTS AND METHODS**

The Ditrane Plus study was an intervention cohort implemented in Abidjan, Côte d'Ivoire in 2001, proposing to HIV-infected pregnant women a prenatal PMTCT antiretroviral treatment combined with post-natal nutritional interventions <sup>6, 7</sup>. Pregnant women were included after having been diagnosed as HIV-infected in one of the six participating community-run health facilities located in the two most densely populated districts of Abidjan. There was no other selection criteria than being at least 18 years old, having accepted the study protocol and

signed an informed consent <sup>8</sup>. The post natal interventions were systematically proposed antenatally by health care workers. Women were hierarchically proposed to either completely avoid breastfeeding, using infant formula from birth or to exclusively breastfeed with the aim to wean on a relatively short period (not exceeding two weeks) and to have completely ceased breastfeeding from three months of age completed. Replacement feeding until nine months of age and the equipment needed were provided free of charge by the project in both instances. Mother-infant pairs were followed up during two years in two clinics exclusively dedicated to the Ditrane Plus study. All transport costs were reimbursed and all care expenses related to any scheduled visit or clinical event were entirely supported by the project.

A total of 60 health care workers recruited from the local area were employed for this study: medical doctors, nutritionists, midwives, nurses, social workers, psychologists, pharmacists and biologists. Before the beginning of the Ditrane Plus study, they all had received a training that consisted in courses on PMTCT and mother and child health, and in a detailed presentation of the Ditrane Plus study protocol including specific counseling on volunteer counseling and testing, family planning and nutritional procedures. All of them were involved in the infant feeding intervention process: prenatal and postnatal nutritional counselling on infant feeding, infant nutritional, clinical and biological follow-up, or provision of the breastmilk substitutes.

We performed in November 2003 a cross-sectional survey using a self-administered anonymous questionnaire among all health care workers involved in the Ditrane Plus project. Information about their knowledge and attitudes concerning infant feeding alternatives to prolonged and predominant breastfeeding proposed within the project as well as their beliefs regarding these practices were collected. They were also interviewed on conceivable infant feeding practices in the context of the future implementation of operational PMTCT activities with free provision of care and treatment to HIV-infected women and their children <sup>9</sup>.

Differences regarding beliefs between infant feeding practices were investigated using Chi-2 or Fisher's exact test for qualitative variables when appropriate. Analysis were performed using the SAS software version 8.2 (SAS Institute, Inc., Cary, NC).

## RESULTS

All but three health care workers of the Ditrane Plus project (N=57) filled in the questionnaire on the 18<sup>th</sup> of November 2003, the remainders were on sick leave.

Concerning the infant feeding interventions proposed within the project, 43% knew the exact proportion of women who had initiated artificial feeding from birth (i.e. half of the cohort), 24% overestimated this proportion, 9% under-estimated it, the remainder acknowledged they did not know. Within the Ditrane Plus project, the presentation of alternatives to prolonged and predominant breastfeeding was supposed to be hierarchical, i.e. firstly complete avoidance of breastfeeding, then exclusive breastfeeding with early cessation from three months of age completed. We asked health care workers to explain how these interventions were presented to the women, 76% underlined this presentation was systematically done hierarchically as planned in the protocol, 10% mentioned the protocol was not followed, whereas 14% recognized it depended of the individual situations.

Overall, 96% of health care workers knew the price of a formula feeding tin (2,000 CFA i.e. around 3 euros), and 65% knew the number of feeds needed daily for a 3-month formula-fed child. According to 69% of health care workers, free provision of breastmilk substitutes till nine months of age within the project was a good strategy since the mothers could not afford it and to avoid the practice of mixed feeding, 21% believed the substitutes should have been given until 12 months of age, whereas 10% underlined the mothers should have purchased them by themselves. At the time of the study, 92% of health care workers were aware of the

fact that some children included had been HIV-infected through breastmilk, of whom 43% knew the exact number of cases.

Beliefs of health care workers and difficulties reported to them by mothers concerning infant feeding practices proposed within the Ditrane Plus project are reported in table 2. According to health care workers, both of the nutritional interventions proposed were difficult to implement and practice, even in the well monitored context of the project. Moreover, 83% underlined that mothers included in the project reported to them at least once that these practices were difficult to carry out. Two thirds of the health care workers surveyed underlined that these two nutritional interventions were responsible for stigmatisation problems with the partner or the family. According to health care workers, early breastfeeding cessation carried higher risk of infant malnutrition and illness than complete avoidance of breastfeeding.

In an operational context of PMTCT activities with free provision of care and treatment to HIV-infected women and their children, 76% of health care workers believed breastmilk substitutes should be freely provided. They also mentioned that complete avoidance of breastfeeding would be more acceptable and feasible for children born to HIV-infected mother rather than exclusive breastfeeding with early cessation (94% vs. 20%,  $p < 0.01$ ). In such an operational context, the choice of the feeding practice should be guided by the socio-economic situation of the mother (45%), the fact that the partner is informed or not of the mother's serostatus (21%), the level of understanding of the mother (19%), the maternal CD4 count (13%), the availability of nutritional management (2%). If the mother would have decided to breastfeed her child, health care workers proposed to wean in median at four months of age (Inter-quartile range: 3-5) in underlying that the sooner they cease

breastfeeding, the lower the risk of post natal transmission is, and that at that age the children would be old enough for the introduction of complementary foods.

## **DISCUSSION**

To our knowledge this study is the first to report health care worker's point of view regarding infant feeding practices aimed at reducing breastmilk HIV transmission. We conducted this study within a research project in Abidjan (Côte d'Ivoire), among health care workers specifically trained to propose to HIV-infected women infant feeding alternatives to prolonged breastfeeding. This survey was anonymous to limit the information bias that could have conducted health providers to report favorable outcomes that reflect themselves in a positive light. Our purpose was to better understand how they dealt with our research protocol in real life situation.

First, PMTCT health care worker's knowledge regarding infant practices proposed within the project was consistent and their attitude was in accordance with the study protocol.

Second, these nutritional interventions were perceived overall as difficult to carry out, especially because of the stigmatisation and infant health problems they could be responsible for. The risk of stigmatisation was perceived as extremely high for the two alternatives to prolonged breastfeeding proposed within the project.

Third, according to health care workers, practice of formula feeding appears safer than early cessation of breastfeeding, considering child health outcomes. This belief should be interpreted cautiously as it could underline a misconception of health care workers concerning the alternatives to prolonged breastfeeding that needs to be taken into account. In this context, it could indeed reveal difficulties to implement early cessation of breastfeeding, a practice which was found to be less common than formula feeding among the general population of women attending community-run health facilities in Abidjan <sup>10</sup>. Further ongoing analysis is

under way to evaluate the acceptability of these alternatives to prolonged breastfeeding, as well as infant severe morbidity, mortality and growth problems according to infant feeding practices, in order to properly investigate this issue.

Health care workers were concerned by breastmilk HIV infections. They urged for the implementation of alternatives to prolonged and predominant breastfeeding, underlying that the provision of the breastmilk substitutes needed would be crucial. Health care workers advisedly pointed out the complexity of the dilemma of infant feeding practices they have to face on a day-to-day basis in the context of HIV in resource constrained countries. Nevertheless, it would have been useful to know in a more balanced way how health workers attitudes affect their counseling practices.

The formation of staff involved in PMTCT programmes is essential and should at least include specific training on mother and child health issues in the context of HIV, correct knowledge of the risk of MTCT, the advantages and disadvantages of each conceivable alternative to prolonged breastfeeding, and on methods to provide appropriate infant feeding counselling and support to HIV infected women. Our study provides useful information that should be taken into account in the training of the staff proposing PMTCT infant feeding interventions in resource-limited settings.

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**Table 1: World Health Organization infant feeding definitions**

<b>Infant feeding practice</b>	<b>Definition</b>
Exclusive breastfeeding	Giving a child no other food or drink, including no water, in addition to breastfeeding with the exception of medicines, vitamin drops or syrups, and mineral supplements <sup>11</sup>
Predominant breastfeeding	Breastfeeding a child but also giving small amounts of water or water based drinks. Neither food-based fluid nor solid food are allowed under this definition <sup>11</sup>
Artificial feeding	Feeding a child on artificial feeds (including infant formula and powdered animal milk), and not breastfeeding at all <sup>12</sup>
Mixed feeding	Breastfeeding while giving non-human milk such as infant formula or food-based fluid or solid food <sup>13</sup>

**Table 2: Beliefs of health care workers and difficulties reported by mothers concerning infant feeding practices proposed within the Ditrane Plus project, Abidjan, Côte d'Ivoire, November 2003.**

	Complete avoidance of breastfeeding N (%)	Exclusive breastfeeding with early cessation N (%)	p-value
<b><u>Beliefs of health care workers</u></b>			
<b>Infant feeding difficult to practice</b>	<b>40 (77)</b>	<b>41 (79)</b>	0.84
the child is more often sick	7 (15)	17 (35)	0.02
it induces child growth problems	4 (8)	8 (16)	0.22
it induces malnutrition problems	1 (2)	20 (40)	< 0.01
it makes the child "silly"	3 (7)	0	0.09
it induces stigmatisation problems with the partner	31 (67)	36 (72)	0.22
it induces stigmatisation problems with the family	32 (68)	34 (68)	0.74
<b><u>Difficulties reported to health care workers by the mothers</u></b>			
<b>No difficulty reported ever</b>	<b>7 (17)</b>	<b>7 (17)</b>	1.00
<b>Difficulty reported at least once</b>	<b>50 (83)</b>	<b>50 (83)</b>	
the child is more often sick	10 (20)	27 (55)	< 0.01
it induces child growth problems	3 (6)	8 (16)	0.11
it induces malnutrition problems	9 (18)	15 (30)	0.17
it makes the child "silly"	15 (30)	5 (10)	0.01
it induces stigmatisation problems with the partner	34 (68)	34 (68)	1.00
it induces stigmatisation problems with the family	35 (69)	30 (60)	0.34