longer lactational amenorrhea. These issues only served to reinforce the consensus among all speakers that the LAM must be incorporated more closely into current NFP programs throughout the world.

It is important to recognize that breastfeeding, especially exclusive breastfeeding, has a profound effect on fertility and on the estrogenic changes that create the signs and symptoms used in various NFP methods. Lactation after menses has returned is not nearly as protective against unplanned pregnancy. Better understanding of the fertility suppressive effects of lactation and its incorporation into NFP teaching could be part of the solution to this problem.

The following articles and discussions explore these and related issues. It is hoped that the conclusions of this session will provide guidance for NFP policy makers and trainers in the introduction of NFP during breastfeeding.

Is the lactational amenorrhea method a part of natural family planning? Biology and policy

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The lactational amenorrhea method is a natural method of family planning for women who breastfeed their infants. The underlying physiology results in a natural suppression of ovulation, and the concomitant amenorrhea, induced by exclusive (or almost exclusive) breastfeeding. This in addition to the infant's age of 6 months or less and specific feeding pattern are the parameters used to identify the possible return of fertility. The lactational amenorrhea method provides at least 98% protection against pregnancy. Data from a recent multicenter study of breastfeeding support the use of the lactational amenorrhea method as a natural family planning method. The lactational amenorrhea method can be incorporated into natural family planning programs and teaching. (Am J Obstet Gynecol 1991;165:2014-9.)

Key words: Natural family planning, breastfeeding, lactational amenorrhea method, postpartum infertility

The natural child-spacing effect of breastfeeding has been long recognized to be associated with amenorrhea and the duration of breastfeeding, particularly full breastfeeding. Furthermore, in population studies only about 5% to 10% of women have been reported to become pregnant while in lactational amenorrhea.[6] This effect received little attention among populations where breastfeeding was not a common practice. However, the incidence and duration of breastfeeding have been changing in both developed and developing countries, particularly since the early 1970s. In developed countries there has been a return to breastfeeding, and well-educated mothers in the higher socioeconomic groups are more likely to breastfeed and breastfeed longer than those from the lower socioeconomic or immigrant groups.[7] In some developing countries, particularly in the urban areas, the pattern is the opposite; the more highly educated are less likely to initiate breastfeeding or to breastfeed for only short periods. In rural areas breastfeeding is more prolonged, but there has been a suggestion of a decline in the initiation and duration of breastfeeding in many populations. Economic changes and recent programs for the promotion and support of breastfeeding are associated with abatement and reversal of the decline in many settings.

The duration of lactational amenorrhea in urban and rural populations also differs markedly from country to country, with a range varying from 2 to 3 months up to 2 to 3 years. In many of these populations breastfeeding has provided the major control of fertility; it delays the return of bleeding/menstruation and ovulation, but it does not permanently prevent pregnancy. The impact of a decline in the duration of breastfeeding and its concomitant effect on lactational amenorrhea, particularly in developing countries, has been high-

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lighted by several writers.[8] For example, in Senegal, where the average duration of breastfeeding and lactational amenorrhea is 19 and 15 months, respectively, a 50% reduction in the duration of breastfeeding would require an increase in contraceptive use from 11% to 35% to maintain current fertility rates.[9]

Natural family planning programs and lactational infertility

Breastfeeding has not been recognized for its important natural effect on fertility or as a natural family planning (NFP) method in most NFP programs in spite of the knowledge presented above. Many NFP programs recognize a 7- to 12-week period of natural infertility after childbirth, which is extended by breastfeeding. This is based on studies of breastfeeding women in which basal body temperature[10, 11] and endometrial biopsy[12] were used as indicators of the probability of ovulation preceding the first postpartum bleed. In these studies most of the women breastfed for 3 to 6 months, with the period of full (or exclusive) breastfeeding even shorter, and solid and liquid supplements (cereal and juice) were introduced as early as 3 to 6 weeks after delivery.

Studies by Gross and Eastman[13] and Brown et al.[14] compared mucus symptoms with serum levels of estrogens and progesterone or their urinary metabolites. They found longer periods of infertility associated with longer durations of full breastfeeding. These findings were incorporated into teaching programs associated with the ovulation method and the sympto-thermal methods developed in Australia. These programs suggest that couples begin observing and recording their signs of fertility from 3 to 5 weeks after delivery. If a couple wants an almost zero risk of pregnancy, they are often counseled to abstain from the seventh or tenth postpartum week until they have evidence of ovulation by a sustained thermal shift of at least 4 days, thus resulting in a long period of abstinence during a period of relative infertility.

Another choice presented by some NFP programs is to wean the baby to facilitate the return of cyclicity and the application of NFP. In other instances couples using NFP methods based on cervical mucus observations are instructed that they can be guided by their observations to determine the days of infertility and possible fertility and to apply the rules for avoiding pregnancy. The mucus signs can be confusing for some, however, and do not always reflect the underlying ovarian activity; signs may suggest ovulation when it is not occurring or fail to indicate ovulation when it does occur. This can result in unnecessary and prolonged abstinence, although this may be acceptable to a couple with a strong desire to avoid another pregnancy. At the same time, pregnancy is possible, although not probable. The short duration of lactational amenorrhea along with a suggested high incidence of first ovulatory bleeds, in spite of low pregnancy rate, were the major influences on NFP programs of the 1970s.

Essentially the western breastfeeding patterns of the 1970s forced on NFP teaching nonacceptance of lactational amenorrhea as a natural method of family planning. Teaching programs with this viewpoint have been extended to the developing countries, where there has been and still should be a reliance on lactational amenorrhea as an effective natural method of birth spacing but with some guidelines as suggested below.

Lactational amenorrhea

The mechanism of lactational amenorrhea is still not well understood. Prolactin levels are elevated during pregnancy and continue to be elevated above normal prepregnancy levels during lactational amenorrhea, but they gradually return to normal as ovarian function returns.[15] Prolactin levels increase in response to suckling and may be a marker of the altered hypothalamic-pituitary axis or may have a direct action on fertility, perhaps at the level of the ovary. Ovulation is prevented or follicular development may be altered, resulting in deficient corpus luteum function, altered endometrium, and infertility. This inhibition of ovarian function can continue even after bleeding resumes, explaining in part the lower than expected pregnancy rate while breastfeeding continues.

More recent studies[15-18] have shown that menses can be delayed on average for 7 to 9 months even in well-nourished western women. Table I summarizes Australian studies indicating the return of vaginal bleeding between 33 to 48 weeks (7½ to 11 months) after delivery, with individual women resuming ovulation as early as 12 weeks and others delaying up to 2 years. Twenty-five percent to 30% of the women resumed menstruation while fully breastfeeding, with varying frequency and duration of breastfeeding episodes. In other populations such as in Chile and Mexico, the duration of amenorrhea is shorter in spite of full breastfeeding of high frequency. In most of the recent studies, 25% to 30% of women have evidence of ovulation (as indicated by adequate levels of serum progesterone or urinary pregnanediol) before the first bleed, but many of these ovulations show evidence of inadequate luteal function.[17] Furthermore, the incidence of ovulatory first bleeds occurring during full breastfeeding and in the first 6 months has been shown to be low, with a suggested pregnancy risk of less than 2%.[19]

The lactational amenorrhea method

An individual couple can rely on breastfeeding to provide natural protection against pregnancy for at least 6 months, provided the mother has no return of

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