Multitasking

Timing of a major depressive episode with the postnatal period

- The major life changes associated with the transition to motherhood are an **obvious potential stressor, and cause emotional disruption** in even the most resilient of women (Beck 2006).
- The prevalence of depression in postnatal women is similar to the incidence in the general female population, there is a **three-fold increase in the incidence of depression in the first five weeks postpartum** (Cox 1993).
- Approximately **one-third of women** who develop postnatal depression may experience symptoms **in the first four weeks**; **two-thirds will develop them between 10 and 14 weeks**; and cases who present later are often misdiagnosed or missed altogether (Hanley 2009).
- Three longitudinal studies from both high-income countries (US and UK) and lowand middle-income countries (Brazil) have found an increase in the incidence and symptoms of postnatal depression **around three months postpartum**, with a second peak occurring around nine months postpartum (Gjerdingen 2011; Lobato 2011;Nott 1987). Nott 1987 even suggests that the incidence of new cases of postnatal depression was highest three to nine months postpartum, which is outside of the period when women would have regular contact with postpartum clinical services and depression screening. The problem for prevention and treatment lies in the lack of consensus

Management of postnatal depression

- The problem for prevention and treatment lies in the lack of consensus regarding the aetiology, definition, and tools for detection of this condition.
- Consequently, the study and management of women with “melancholia” after childbirth (Brockington 1996) has fallen between several disciplines - that of primary care, obstetrics, and psychiatry.
- There are multiple pathways towards an episode of postnatal depression, and different women will find alternative modes of treatment and/or support to be effective (Austin 2008; NHMRC 1999).

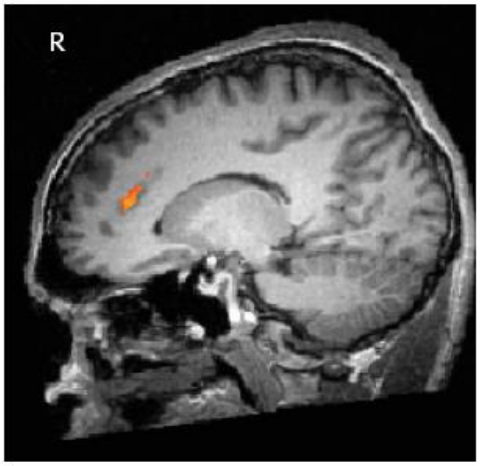
Why it is important to do this review about dietary supplements for preventing postnatal depression

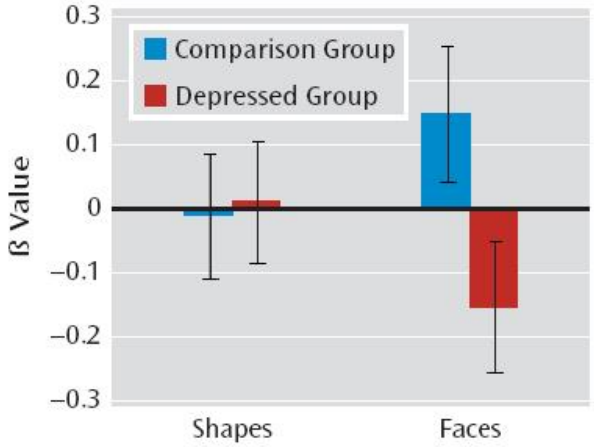
Postnatal depression can cause **impaired maternal-infant interactions** (Cooper 1998; Murray 1996) and **negative perceptions of infant behaviour** (Mayberry 1993) that have been linked to **attachment insecurity** (Hipwell 2000; Murray 1992).
Other effects on the infant include cognitive developmental delay (Deave 2008; Hipwell 2000), social/interaction difficulties (Cummings 1994; Murray 1999), impaired expressive language development (Cox 1987), attention- (Breznitz 1988), and **long-term behavioural problems** (Beck 1999).

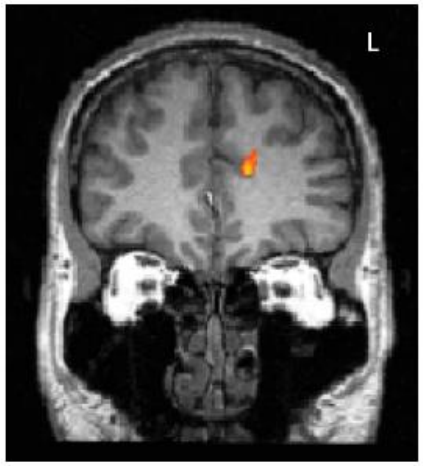
Normally Reduced Dorsomedial Prefrontal Cortical Activity and Effective Connectivity With Amygdala in Response to Negative Emotional Faces in Postpartum Depression

Am. J. Psychiatry, 2010, riv Biggio G.

Group-by-Condition Interaction in the Dorsomedial Prefrontal Cortex Among Depressed and Healthy Mothers[a]







[a] Error bars represent the standard deviation of the mean ($F \geq 9.28$, $df = 1, 28$, $p < 0.05$).

Dietary supplements for preventing postnatal depression
(Review)
Miller BJ, Murray L, Beckmann MM, Kent T, Macfarlane B

- An hypothesis is that certain dietary deficiencies in a pregnant or postnatal woman's diet may cause postnatal depression. Hence, correcting these deficiencies with dietary supplements could prevent postnatal depression.
- The intervention considered was dietary supplements given before the onset or diagnosis of postnatal depression.

Examples include

- **Omega-3 fatty acids**
- **Iron**
- **Calcium**
- **Vitamin B12 (cobalamin)**
- **Riboflavin (B2)**
- **Vitamin B6 (pyridoxine)**
- **Folate**
- **S-adenosyl-methionine (SAMe)**
- **Vitamin D (Freeman 2009).**

- Dietary supplements were defined as any vitamin, mineral or compound that exists naturally and could be reasonably expected to be part of the normal human diet. Intervention with supplementation would be expected to correct a current or potential deficit in these vitamins, minerals or other compounds.

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2013, Issue 10 http://www.thecochranelibrary.com **Dietary supplements**

How the intervention might work

- Specific hypotheses for how each intervention works are related to the particular intervention
- **Iron supplements** may prevent iron deficiency anaemia, hence preventing maternal lethargy and concomitant depression. But iron deficiency also affects electrophysiological recordings and neurotransmitter metabolism with no direct association to anaemia (Beard 2005). Correcting iron deficiency may normalise neural functioning through direct electrochemical mechanisms.
- **Omega-3 fatty acids** are known to affect neurotransmitters, peptides, releasing factors, hormones, and a variety of physiological and cognitive processes. Fatty acids alsomay exert a controlling function in the modulation of neuronal membrane fluidity (Yehuda 1999).

iron treatment and mothers' depression

- In one study, iron treatment resulted in a 25% improvement in previously iron-deficient and stress scales, whereas anaemic mothers who received placebo did not improve (Beard 2005).
- Anaemia is a risk factor for postnatal depression (Corwin 2003), hence postpartum haemorrhage may also be a cause of postnatal depression.
- Albacar (Albacar 2011) found an association between low ferritin 48 hours after delivery and postpartum depression.

folate and B vitamins and mothers' depression

- One prospective study examined the relationship of dietary consumption of folate and B vitamins during pregnancy with the risk of postpartum depression (Miyake 2006).
- There was no measurable association between intake of folate, cobalamin, or pyridoxine and the risk of postpartum depression.
- Compared with riboflavin intake in the first quartile, only riboflavin consumption in the third quartile was independently related to a decreased risk of postpartum depression.

How the intervention might work

- **Nuclear receptors for vitamin D** exist in neurons and glial cells. Vitamin D is involved in the biosynthesis of neurotrophic factors, and at least one enzyme involved in neurotransmitter synthesis. Vitamin D can also inhibit the synthesis of inducible nitric oxide synthase and increase glutathione levels, suggesting a role for the hormone in brain detoxification pathways (Garcion 2002).

- **S-adenosyl-L-methionine** is involved in methylation of biological proteins which are integral to neural functioning of neurotransmitters, phospholipids, and cellular receptors and channels (Mischoulon 2002). **Folate** also is involved in methylation of homocysteine and a deficiency may have a similar effect biochemically to a deficiency of S-adenosyl-L-methionine (Freeman

Omega-3 polyunsaturated fatty acids

- **Omega-3 polyunsaturated fatty acids** are found in oily fish and seafood as docosahexanoic acid (**DHA**) and eicosapentaenoic acid (**EPA)**.
- During the last century, the diets of industrialised societies have contained significantly lower amounts of omega-3 fatty acids, and relatively higher levels of omega-6 polyunsaturated fatty acids (Simopoulos 2008).
- There also appears to be **a correlation between fish consumption rates and depression,** with lower reported incidence of depression in people from Hong Kong, China, and Japan compared with Western countries (Hibbeln 2002).
- **Lower rates of fish consumption have also been correlated with higher rates of postnatal depression** (Rees 2005).

- It has been **hypothesised that if low omega-3 levels are associated with depression, one reason women are more vulnerable to depression postnatally is due to depletion of their omega-3 fatty acids** (Rees 2005).

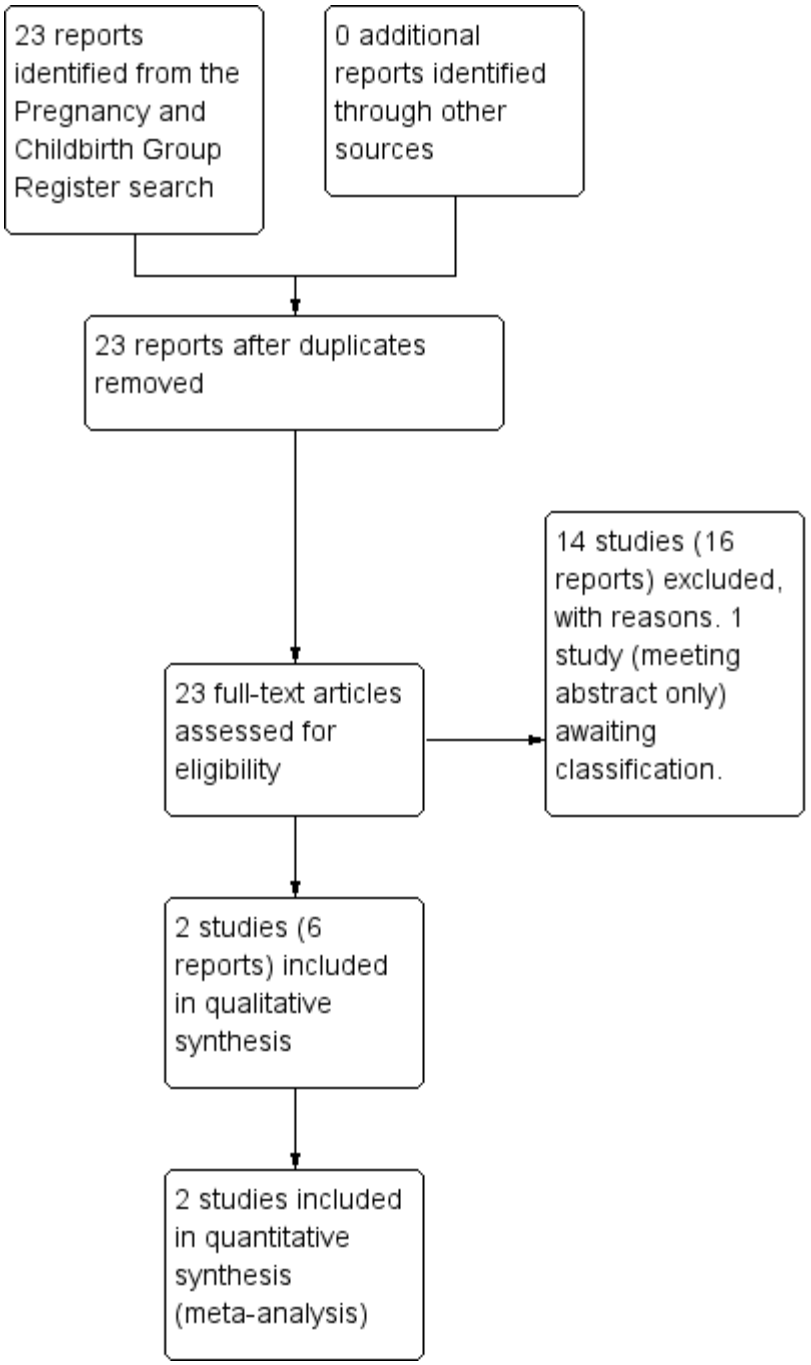
Omega-3 fatty acid supplementation and the risk of perinatal depression.
A previous non-Cochrane systematic review (Wojcicki 2011)

- Wojcicki 2011 looked at the association between omega-3 fatty acid supplementation and the risk of perinatal depression.
- It reviewed 10 articles and found that six found no association, two found mixed results and two found a positive association between omega-3 supplementation and reduced risk of perinatal depression.
- This review included longitudinal cohort studies, randomised controlled trials and pilot trials. All of the randomised controlled trials included mixed populations of depressed and non-depressed women on entry into the studies so none of these studies could be classified as purely investigating a prevention effect of omega-3 fatty acids on postnatal depression.

Dietary supplements for preventing postnatal depression (Review)
The Cochrane Collaboration.

The randomised controlled study **(Mozurkewich 2013)** compared docosahexanoic acid **(DHA**) and eicosapentaenoic acid **(EPA)** with placebo.
Enrolled participants were randomised to 1 of 3 groups: a) EPA-rich fish oil supplement (1060 mg EPA plus 274 mg DHA); b) DHA-rich fish oil supplement (900 mg DHA plus 180 mg EPA; or c) a placebo
The primary outcome for this study was the BDI score at 6 weeks postpartum.

The randomised controlled trial **(Mokhber 2011)** compared **daily supplementation with selenium tablets (100 µg)** versus a placebo control.
Outcome: The mean serum selenium level (µg/dL ± SD) was measured pretrial and post-trial The self reported mean EPDS score (± SD) post-trial for the selenium group was 8.8 ± 5.1 and for the placebo group post-trial was 10.7 ± 4.4



The results of Mozurkewich 2013

Mozurkewich E, Chilimigras J, Klemens C, Keeton K, Allbaugh L, Hamilton S, et al.The mothers, Omega-3 and mental health study protocol. *BMC Pregnancy and Childbirth 2011;**11:46.*** Mozurkewich E, Clinton C, Chilimigras J, Hamilton S, Allbaugh L, Berman D, et al.The Mothers, Omega- 3 & Mental Health Study: a double-blind, randomized controlled trial. *American Journal of Obstetrics and Gynecology 2013;**208(1 Suppl):S19–S20.***

- The randomised controlled study (Mozurkewich 2013) compared docosahe xanoic acid (DHA) and eicosapentaenoic acid (EPA) with placebo.
- The trial randomised 126 women at risk of postpartum depression to three arms of the trial: 42 were allocated to EPA, 42 to DHA and 42 to placebo.
- Three women in the EPA arm, four in the DHA arm, and one woman in the placebo arm were lost to follow-up.
- Women who were found to have major depressive disorder, bipolar disorder, current substance abuse or dependence, suicidal ideation, schizophrenia, coagulation disorders, or known to have a multiple gestation at recruitment were excluded from the study.
- The women who discontinued the intervention (five in the EPA arm, four in the DHA arm and seven in the placebo arm) were included in the intention-to-treat analysis, while those who were lost to follow-up were not.
- Women received supplements or placebo from recruitment at gestational age of 12 to 20 weeks until their final review visit at six to eight weeks postpartum.
- The primary outcome measure was the BDI score at the fifth visit (six to eight weeks postpartum).

- **No benefit for DHA-rich fish oil for prevention of depressive symptoms among women who were not selected based on**

The results of Mokhber 2011

Mokhber N, Namjoo M, Tara F, Boskabadi H, Rayman, MP, Ghayour-Mobarhan M, et al: **Effect of supplementation with selenium on postpartum depression: a randomized double-blind placebo-controlled trial**. *Journal of Maternal- Fetal and Neonatal Medicine 2011;**24(1):104–8.***

- The study by Mokhber et al (Mokhber 2011), showed a favourable effect on mean EPDS scores in women in taking **selenium 100 µg daily tablets compared with placebo for the prevention of postnatal depression.**

- However, there is insufficient evidence to make strong recommendations for or against the use of selenium in this population and there is no evidence regarding the use of any other dietary supplements in this population.

Dietary supplements
is no
a strategy for the prevention and treatment of postnatal depression.

- Several Cochrane reviews have considered various strategies for the prevention and treatment of postnatal depression.
- However, to date there appears **to be no effective strategy for the prevention** of postnatal depression among these reviews.
- Hence, certain nutritional deficiencies such as low levels of DHA found in seafood, calcium, B vitamins, vitamin D, and iron have been investigated in relation to postnatal depression but so far this research has been inconclusive (Hanley 2009; Miller 2002).
- Further research into the biological aetiology of postnatal depression is required, as studies to date have been quasi-experimental, or randomised controlled trials with small sample sizes of varying methodological quality (Dennis 2009; Miller 2002).

BABY STIMULI AND THE PARENT BRAIN:

Functional Neuroimaging of the Neural Substrates of Parent-Infant Attachment

Psychology, 2008 modif. Biggio G.

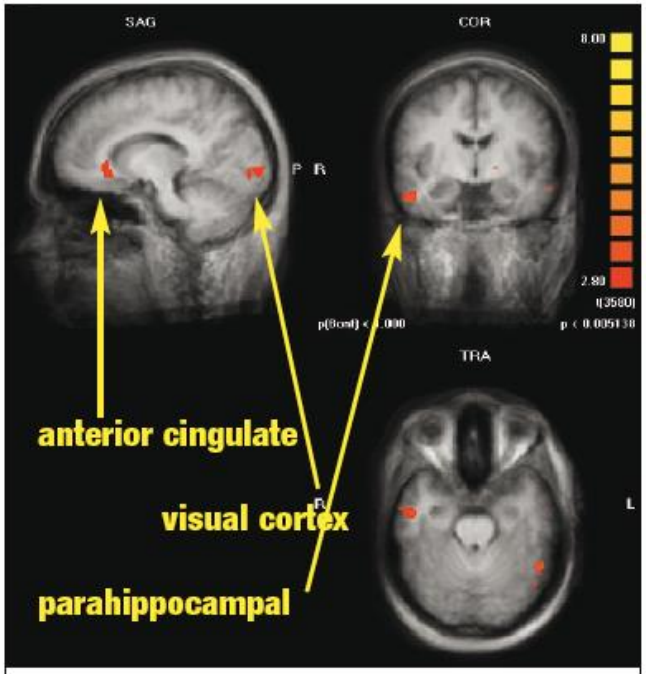


FIGURE 2A. First-time father, 2–4 weeks postpartum, own vs. other baby cry

anterior cinglate, visual, temporal/parahippocampal

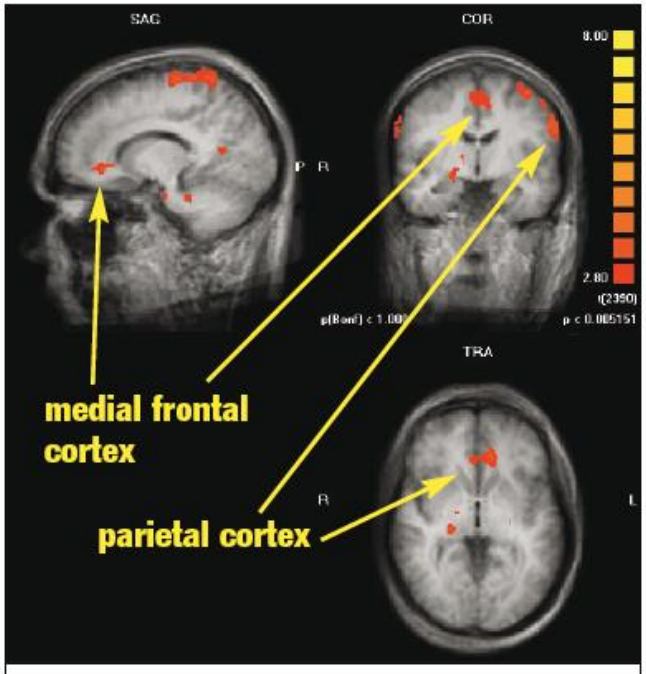
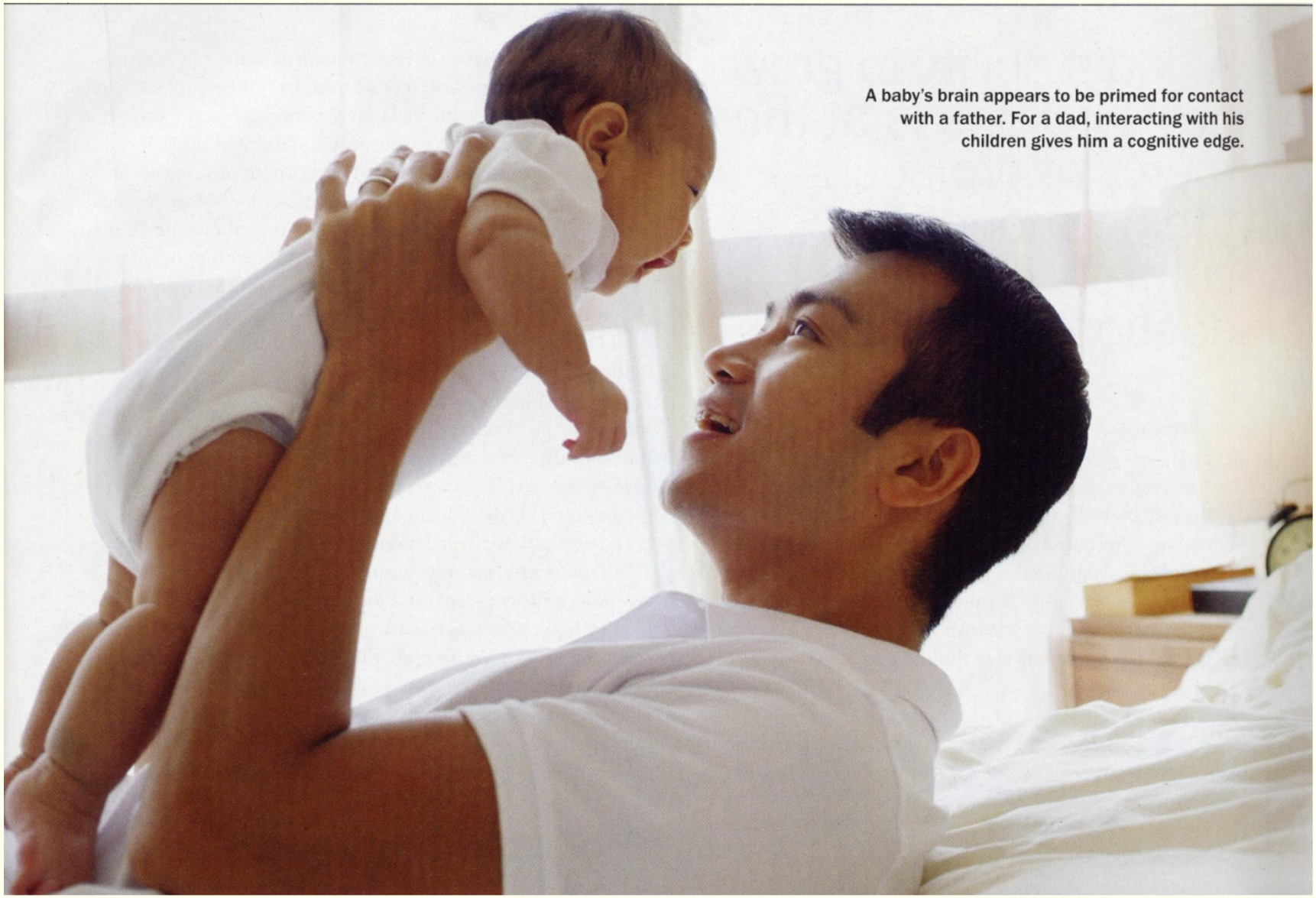


FIGURE 2B. First-time father, 3–4 months postpartum, own vs. other baby cry

anterior and cingulate, medial frontal, parietal

The Biology of Paternal Care in Human and Nonhuman Primates. *Annu. Rev. Anthropol., 2009*



A baby's brain appears to be primed for contact with a father. For a dad, interacting with his children gives him a cognitive edge.

La presenza di un' équipe esclusivamente femminile permette alle pazienti di trovare una comprensione attenta ed empatica alla sintomatologia depressiva che corre in quelle specifiche fasi di vita (gravidanza, post-partum, perimenopausa) che caratterizzano solo l'esistenza di una donna

GRAZIE per l'Attenzione