

Life after 'Colic': Long term outcomes of early infant crying

Mary Brown, Ralf Heine & Brigid Jordan.

The University of Melbourne
Murdoch Childrens Research Institute
Royal Children's Hospital



Plate 2.3.1-2 'The screaming of infants consists of prolonged expirations with short and rapid, almost spasmodic inspiration, followed at a somewhat more advanced age by sobbing'. Darwin, *The Expression of Emotions*, 1872, p. 158. Source: Cambridge University Library.



The Irritable Infant Intervention Study

3

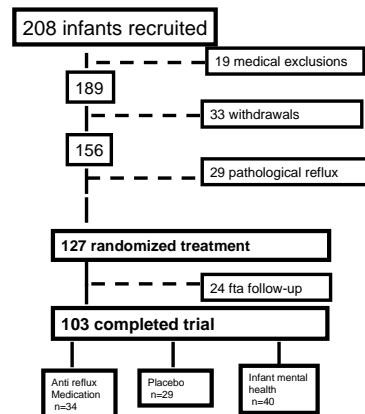
iii study

- ? Effect of anti reflux medical treatment & infant mental health intervention
- infants < 9 months of age
- admitted to hospital
- parent complaint of persistent crying

Reason for presenting to the hospital

- Worried the baby was sick 45
- Last resort 36
- Referred by Paediatrician 32
- Wanted a second opinion 15
- Referred by General Practitioner 10
- Other reasons 8
- Referred by MCHN 4

(n=99)



Sample n=103

- Mean age 3.2 months (range 0.5-8.2, SD1.98)
- 56 (44%) > 3 months old
- 52 (41%) firstborn
- 67 (53%) male
- 25% previous admission to hospital/mother baby unit

On admission

- Infant crying
 - Mean 253 minutes (SD 96.5)
 - 80% cried >3 hrs
 - 50% cried > 4 hours
- Mothers:
 - 75% daily/weekly contact with mgn
 - 69% 'very good' or 'excellent' support from mgn
- Experience of Motherhood Questionnaire: mean 44.8 (SD8.6)

Research protocol

Admission: Randomization

medical/placebo

infant mental health

Day 1: History, physical exam, urinalysis
24 hour 'cry chart'
Baseline Questionnaires

Day 2: 24 hr pH monitoring

imh consultation

Day 3: discharge

active/placebo randomization

Week 4: 24 hour 'cry chart'
Questionnaires & Interview

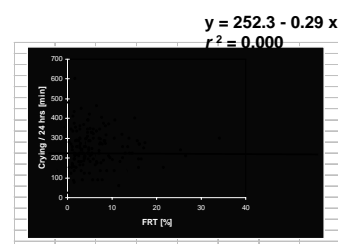
interventions

- Medical group (anti reflux medication or placebo)
 - Standard medical care
 - Referral to social work/mental health as indicated
 - Mixture A & Mixture B
- Active group: ranitidine (Zantac)+ cisapride (Prepulsid)*

Infant mental health consultation

- 90 min consult w MCHN & SW on ward
- Focus
 - Infant experience and emotional development
 - Mother infant interaction and attachment relationship
 - Parental emotional factors impacting on infant behavioural regulation or parent response to crying
- Individualized parent and nursing care plan for infant

Crying and fractional reflux time



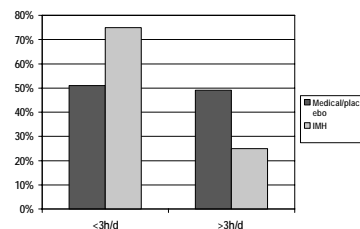
Predictors of pathological reflux

- Vomiting frequency (5+ times per day)

NOT

volume of vomit
feeding refusal
back arching
extending head

Crying

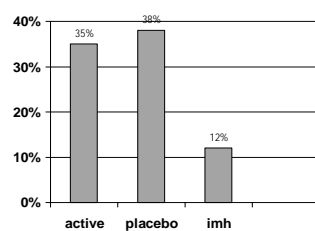


p=0.05

Findings

- Anti reflux medication not superior to placebo in reducing crying duration/ frequency/length of longest bout
- Mean reduction crying 94min
- Relative reduction similar in all 3 groups
- Reduction in maternal stress similar in all groups
- 27% of mothers (EPDS >13) at trial completion

Subsequent admit to mother baby unit



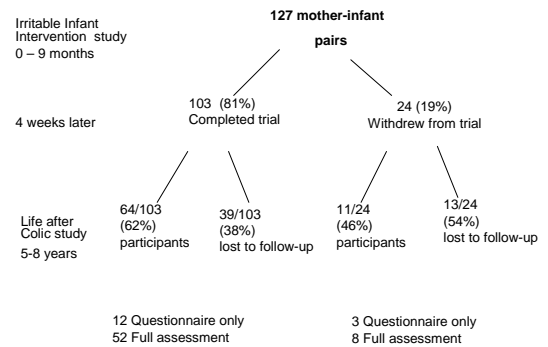
Fisher's exact p = 0.02

Life after Colic

aims

- Prevalence of health & mental health problems at early school age in cohort of irritable infants admitted to hospital with persistent crying
- Identify early predictors of mental health problems

- 127 sent invitation letter by iii investigator
- Non responders sent another letter
- Electoral rolls and telephone directories if address changed
- Health Insurance Commission sent letter
- Responders contacted by researcher to arrange interview time



participants vs non participants

- *No difference*
 - Infant Age
 - Gender
 - Birth order
 - Other problems (feeding ,sleeping)
 - Crying behaviour
- Maternal distress
 - EPDS mean score 11(6.6) vs 8.6 in non participants p=0.05

hypotheses

- The prevalence of physical health problems would be no different from community norms.
- Despite a normal prevalence of physical health problems, parents would perceive their child as vulnerable.
- There would be a high prevalence of emotional and behavioural problems.

Evaluation measures

- Study questionnaire
 - Childs health & use of health services
 - Sleeping habits
 - Separations from parents
 - Socio demographic
- Forsyth Vulnerability Scale (Forsyth 1996)
- Strengths and Difficulties Questionnaire (Goodman 1997)
- Child Health Questionnaire – CHQ P50 (Waters 1999)

measures

- Child interview :
 - Mental State Exam – talking ,drawing and play
- Interview with mother

comparison data

- Australia's children: their health and wellbeing 2002
- Child and Adolescent Component of the National Survey of Mental Health and Wellbeing
- The Mental Health of Children and Adolescents in Great Britain
- The Health of Young Victorians Study

Demographic data

- Mean age 6.8 yrs (4.8-8.3, SD 0.5)
- 52% boys
- 52% < 3 months old at entry to infancy study
- 39% firstborn. 17% only child
- 53 (71%) families intact, 9 (12%) single parent, 13 (17%) step or blended families

Physical health outcome

- Medical cause for colic ?
 - 2 x allergies
 - 1 NIDS
- 72/75 globally rated child's health as good
(bronchiectasis, severe allergies, suicidal thoughts)
- No difference prevalence of childhood illnesses
- No difference health service use (Medicare data)

Child mental health problems

- Strengths and Difficulties Questionnaire (Goodman 1997)
- Parent questionnaire
- 25 questions about child attributes
 - Emotional symptoms
 - + Conduct problems
 - + Hyperactivity-inattention
 - + Peer relationship problems
 - = Total difficulties score
- Impact score – how much problems interfere w child's everyday life

SDQ Results (scores in abnormal range)

| | Life after colic (n=75) | UK Community* sample (n=5855) | Risk ratio (95% CI) |
|-------------------------------|----------------------------|-------------------------------------|---------------------|
| Total difficulties | 19 (25.3%) | 580 (9.9%) | 2.56 (1.72, 3.80) |
| Emotional symptoms | 24 (32%) | 632 (10.8%) | 2.96 (2.11, 4.16) |
| Conduct problems | 23 (30.7%) | 767 (13.1%) | 2.34 (1.66, 3.31) |
| Hyperactivity/ inattention | 16 (21.3%) | 943 (16.1%) | 1.32 (0.85, 2.05) |
| Peer problems | 11 (14.7%) | 644 (11.0%) | 1.33 (0.77, 2.31) |
| Total impact score | 17 (22.7%) | 457 (7.8%) | 2.90 (1.89, 4.45) |

* 1999 UK National Survey of Mental Health of Children and Adolescents

Impact of mental health problems on child

| Impact on child (n=75) | Quite a lot | A great deal | Total significant |
|--|-------------|--------------|-------------------|
| A cause of distress or upset to the child | 12 (16%) | 5 (7%) | 17 (23%) |
| Interferes with child's home life | 11 (15%) | 4 (5%) | 15 (20%) |
| Interferes with child's friendships | 5 (7%) | 2 (3%) | 7 (10%) |
| Interferes with child's classroom learning | 6 (8%) | 5 (7%) | 11 (15%) |
| Interferes with leisure activities | 6 (8%) | 4 (5%) | 10 (13%) |

Mental Disorders

DSM-IV criteria

| Diagnosis | Total (n=61) | UK Study (ISD)* |
|---|--------------|-----------------|
| Any disorders | 15 (24.6%) | 8.2% |
| Emotional disorders | | |
| Generalised anxiety disorder | 2 (3.3%) | 0.7% |
| Depressive disorder (NOS) | 2 (3.3%) | 0.2% |
| Attention-deficit and disruptive behaviour disorders | | |
| ADHD | 1 (3.2%) | 2.3% |
| Oppositional defiant disorder | 11(18%) | 3.5% |

* 1999 UK National Survey of Mental Health of Children and Adolescents

Child Health Questionnaire (Waters 1999)

- Burden on family of child health problems
- Impact on parents
 - Emotional
 - Time
- Impact on family
 - Activities
 - Cohesion

Burden of child's health/mental health problems on parent and family - CHQ

| | Life after Colic (n=75) Mean (SD) | Normative sample* (n=5212) Mean (SD) | p value |
|-----------------------------------|--------------------------------------|---|---------|
| Burden over life of family | | | |
| Family activities | 63.3 (26.3) | 85.5 (16.7) | <0.001 |
| Parent time for own needs | 70.4 (29.5) | 91.5 (16.4) | <0.001 |
| Worry/concern | 56.9 (28.4) | 80.5 (20.1) | <0.001 |
| Burden over last 4 weeks | | | |
| Limited family activities | 77.8 (22.2) | 85.5 (16.7) | <0.001 |

* Health of young Victorians survey (1998)

Parental perception of child vulnerability

- 23/75 (31%) classified as vulnerable by parent.
- USA Community samples 10%

Predictive factors for DSM IV diagnosis

| Characteristics | Normal (n=46) | Disorder (n=15) | p |
|--|---------------|-----------------|------|
| Birth order – firstborn | 14/46 | 10/15 | 0.02 |
| Sleeping difficulties present (n=60) | 34/46 | 14/14 | |
| Birth/pregnancy complications | | | |
| Illness during pregnancy (n=50) | 13/38 | 8/12 | 0.09 |
| Psychological changes in pregnancy n=51) | 23/39 | 11/12 | 0.04 |
| Experience of Motherhood | | | |
| Day 1 (mean, SD) (n=60) | 44 (7.5) | 50 (9.1) | 0.04 |
| Hospital admission prior to study | 9/43 | 7/14 | 0.03 |

Maternal reports at infancy follow-up & DSM diagnosis

| Maternal perception | Mental disorder n=15 | No mental disorder n=46 | p value |
|------------------------------|----------------------|-------------------------|-------------|
| Crying Duration | | | |
| Same /worse (n=13) | 6 (40%) | 7 (15%) | 0.04 |
| Less (n=38) | 6 (40%) | 32 (70%) | |
| Data missing (n=10) | 3 (20%) | 7 (15%) | |
| Baby's routine | | | |
| Same/worse n=15 | 7 (47%) | 8 (17%) | 0.03 |
| Better n=36 | 5 (33%) | 31 (67%) | |
| Data missing n=10 | 3 (20%) | 7 (15.2%) | |
| Ease of settling baby | | | |
| Same/worse | 4 (27%) | 10(22%) | 0.09 |
| Easier | 8 (53%) | 29 (63%) | |
| Data missing | 3 (20%) | 7 (15.2%) | |
| Enjoyment of baby day | | | |
| No improvement | 4 (27%) | 4 (8.7%) | 0.08 |
| Better | 8 (53%) | 35 (76%) | |
| Data missing | 3 (20%) | 7 (15.2%) | |

DSM IV Criteria for oppositional defiant disorder

- A. A pattern of negativistic, hostile and defiant behaviour lasting at least 6 months
- At least 4 of the following:
 - Often loses temper
 - Often argues with adults
 - Often actively defies or refuses to comply with adults requests or rules
 - Often deliberately annoys people
 - Often blames others for his or her mistakes or misbehaviour
 - Is often touchy or easily annoyed by others
 - Is often angry and resentful
 - Is often spiteful or vindictive
- A. Clinically significant impairment in social, academic or occupational functioning

Summary of findings

- No significant difference in physical health problems or use of health resources
- ¼ of children have mental health problems on SDQ – emotional and conduct problems
- ¼ have a DSM IV diagnosis on clinical examination
- Problems are seen to impact on child + family
- No age group difference
- Infancy factors assoc with diagnosis
 - Mother reports no improvement in baby (crying, routine) ? enjoyment of baby
 - Firstborn
 - Psychological changes in pregnancy
 - Maternal distress when baby admitted
 - Previous 'unsuccessful' admissions

conclusion

- Crying a sign or a cause of impaired relationships and emotional regulation difficulties?
- Not always a benign transient disorder
- Beware re prediction of ODD
 - extreme sample
 - what does ODD really mean? - is it actually an attachment disorder?? Breakdown in intuitive parenting? emotional regulation problem?
 - Do treatment regimes contribute eg behaviour 'management'/ controlled crying rather than relationship attunement?

Recommendations

- Waiting lists a problem
- Need for integrated maternal and child health/paediatric/mental health services
- Focus on infant's emotional regulation, mental health, infant parent attachment relationship and parents mental health and relationship
- More research – which infants and parents at risk for poor outcomes?