

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

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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

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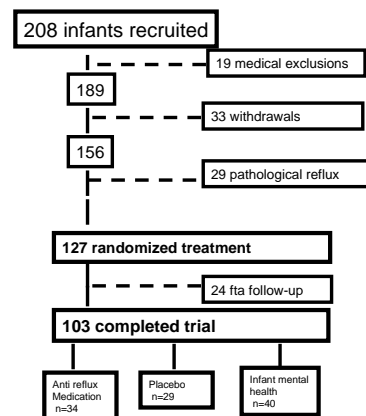
### iii study

- ? 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

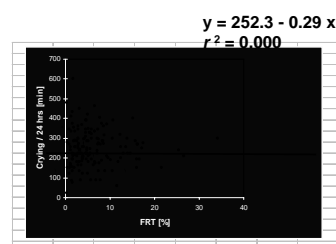
## interventions

- 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



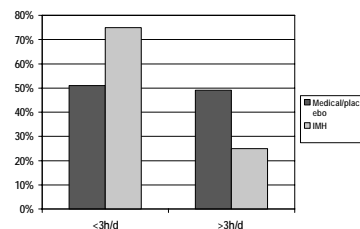
## Predictors of pathological reflux

- Vomiting frequency ( 5+ times per day)

### NOT

volume of vomit  
feeding refusal  
back arching  
extending head

## Crying

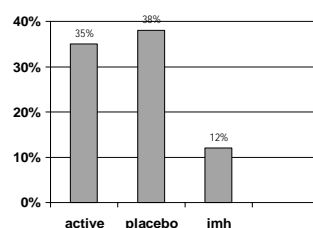


p=0.05

## 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



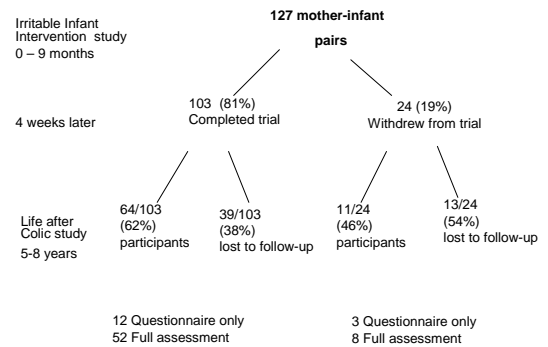
Fisher's exact p = 0.02

## 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%)	<b>17 (23%)</b>
Interferes with child's home life	11 (15%)	4 (5%)	<b>15 (20%)</b>
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%
<b>Emotional disorders</b>		
Generalised anxiety disorder	2 (3.3%)	0.7%
Depressive disorder (NOS)	2 (3.3%)	0.2%
<b>Attention-deficit and disruptive behaviour disorders</b>		
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
<b>Burden over life of family</b>			
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
<b>Burden over last 4 weeks</b>			
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	
<i>Birth/pregnancy complications</i>			
Illness during pregnancy (n=50)	13/38	8/12	0.09
Psychological changes in pregnancy n=51)	23/39	11/12	0.04
<i>Experience of Motherhood</i>			
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
<b>Crying Duration</b>			
Same /worse (n=13)	6 (40%)	7 (15%)	<b>0.04</b>
Less (n=38)	6 (40%)	32 (70%)	
Data missing (n=10)	3 (20%)	7 (15%)	
<b>Baby's routine</b>			
Same/worse n=15	7 (47%)	8 (17%)	<b>0.03</b>
Better n=36	5 (33%)	31 (67%)	
Data missing n=10	3 (20%)	7 (15.2%)	
<b>Ease of settling baby</b>			
Same/worse	4 (27%)	10(22%)	0.09
Easier	8 (53%)	29 (63%)	
Data missing	3 (20%)	7 (15.2%)	
<b>Enjoyment of baby day</b>			
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?