

Early life stress of infants in the SPRING home visits intervention promoting child growth and development in rural India (SPRING-ELS): development of stress measures for administration at scale



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Background

The SPRING randomised controlled trial in rural India evaluates a programme of monthly home visits focussing on nutrition and child stimulation from pregnancy through the first two years of life

The SPRING-ELS (Early Life Stress) sub-study measures stress in one year old infants over a two-day home assessment visit:

- **Saliva cortisol** (measuring daily cortisol rhythm): samples taken six times over two days – early morning, midday & late-afternoon.
- **Hair cortisol** (measuring chronic stress): one sample, 3cm length, minimum 10mg weight
- **Questionnaires** assessing environmental stressors: developed using existing & new tools

This poster presents formative research used to develop these stress measures for administration at scale in a field-trial setting

Methods

Aim	Method
To develop questionnaires by understanding cultural models of child stress	<ul style="list-style-type: none"> • Eight focus group discussions with 45 mothers of children under two years of age
To determine barriers to saliva & hair sampling in young children	<ul style="list-style-type: none"> • In-depth interviews: mothers & barbers (seven) • Focus group discussions: mothers, grandmothers & barbers (five) • Pilot sampling: saliva & hair (13)



Pilot saliva sampling



Pilot hair sampling

Results

Understanding of Infant Stress in Rural Haryana

1. **Causes of stress:** violence, poverty, poor hygiene, neglect, mother's stress, lack of adult care, carer alcoholism
2. **Consequences of stress:** impairment of physical and mental development including *Kamjor* (constitutional weakness), poor sociability, distress and confused behaviours & emotions
3. **Pathogenesis & Timing of stress:** Stress and adversity causes problems to the developing brain, however this cannot start until a child 'understands' their situation (usually around 2-4 years)
4. **Prevention of consequences of stress:** adult support and love can prevent stressors leading to negative consequences
5. **Treatment:** Support, love and care from supportive adults can treat the consequences of stress

Barriers to Hair & Saliva Sampling

Saliva	<ul style="list-style-type: none"> • No cultural barriers found • Mothers know & remember wake & feeding timings • Samples stay cool in insulated flask even at air temperature 40°C+
Hair	<ul style="list-style-type: none"> • Major cultural barriers to hair cutting • Many children have bald heads, especially in summer • Not appropriate to cut hair in public place • Hair cutting cannot be done on Tuesdays throughout study area & often not on Thursdays <p>Solutions: Hair cutting done at home & sample size increased to account for refusals and short hair</p>

Administration at scale

- Both biological and questionnaire measures of early life stress in the community are feasible and acceptable
- Although there are major cultural barriers to hair cutting, careful community-introduction kept the refusal rate to around 14%
- Taking six saliva samples over two days was demanding but achievable. Families were willing to engage with the study team for these detailed child assessments at home
- Over 4000 saliva & 600 hair samples have been collected on over 700 one year old infants & ELS questionnaires administered with their mothers
- This is the largest community-based intervention trial in a low/middle income country incorporating early life stress & the first time hair cortisol has been studied in infants in South Asia
- Laboratory work is ongoing. Results will be published mid-2017

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