

Period of Purple Crying Program for the Prevention of Abusive Head Trauma/Shaken Baby Syndrome

E. Power,^{1,2} F. Sharif,^{3,4,5}

1. University Hospital Limerick, Limerick.
2. School of Medicine, University College Dublin.
3. Department of Paediatrics, Mullingar Regional Hospital, Westmeath.
4. Department of Paediatrics, Royal College of Surgeons in Ireland (RCSI), Dublin.
5. Department of Paediatrics, University College Dublin, Dublin.

Abstract

The *Period of PURPLE Crying Program* is an educational program delivered to parents of newborn children that aims to reduce the incidence of abusive head trauma/shaken baby syndrome¹. The program was developed by a research-based, non-profit organisation and has already been implemented in many countries around the world. It educates parents on what to expect during the first few months of their newborn infant's life, allowing parents to become more informed and better prepared to care for their child. The recent surge in the number of cases of abusive head trauma in children during the COVID-19 pandemic has highlighted the need for greater resources being made available to parents. The *Period of PURPLE Crying Program* is one such resource that could be implemented in Ireland.

Introduction

Primary care providers in Paediatrics are in a unique position to educate parents and carers of newborn babies in order to ensure the best start to life in a safe and nurturing environment. One of the most distressing situations in Paediatrics is child abuse, the worst form of it being abusive head trauma (AHT) in children, also known as shaken baby syndrome (SBS). This problem has come to the fore in recent months with the news that there has been a marked increase in the incidence of AHT in infants during the COVID-19 pandemic.² It is widely agreed that one of the main precipitants of AHT is frequent and consistent periods of crying by the infant, leading to feelings of frustration, anger and hopelessness in the parent, resulting in AHT.³ The primary course of action for AHT in children is preventative through the use of parental education resources, such as that of the *Period of PURPLE Crying* program.

Why is abusive head trauma so concerning?

Brain and head injuries are the most common cause of death from trauma in children less than 2 years of age, with somewhere between 14 and 40 cases of AHT per 100,000 children occurring each year.⁴ Fifteen percent to twenty-three percent (15-23%) of children with AHT die within hours or days, while approximately one-third of survivors become severely disabled, one-third become moderately disabled and one-third have no or mild symptoms.⁵ Although the incidence is relatively small, the magnitude of the consequences is significant. While there is insufficient data on the exact numbers of AHT in children in Ireland, one Irish study has shown that the awareness of AHT remains low, with 50% of parents of newborns claiming that they had no prior knowledge of AHT or SBS.⁶ Recent research reporting that there was a 1493% increase in cases of AHT during the first month of the COVID-19 lockdown in the United Kingdom has also underpinned the need for increased parental awareness with regard to preventing AHT.² Thus, education is needed to ensure that parents are aware of what to expect from newborns, particularly in relation to the normal physiology of infant crying in the first few months of life and how to cope with such, so that there is increased awareness and decreased incidence of AHT.

What type of education is recommended?

The *Period of PURPLE Crying* program is a research-based non-profit charity educational program for parents, that was developed jointly by Dr Ronald G. Barr, a developmental paediatrician, and the National Center on Shaken Baby Syndrome in the USA. The program is already implemented in various countries around the world. The program has two aims; the first is to support caregivers in their understanding of early increased infant crying and the second is to reduce the incidence of AHT.¹ Healthcare professionals register for the hour-long course, which is composed of a number of videos, a booklet and implementation training. They are then equipped with the knowledge, tools and resources necessary to educate parents. This information is then delivered to parents, who receive their own set of program materials, consisting of a 10-page booklet along with a DVD or mobile application containing the 10-minute *Period of PURPLE Crying* video and a 17-minute *Crying, Soothing and Coping* video. This use of a take-home video and booklet allows parents access to the information whenever they may need it and they can also share the knowledge with anyone caring for their baby.

What does *Period of PURPLE Crying* mean?

The "*Period of PURPLE Crying*" is the period in the first few months of an infant's life whereby the infant excessively cries. It is often described as "infantile colic" and accounts for 10-20% of paediatrician visits for infants aged from 2 weeks to 3 months⁷. This colic is described as crying that lasts longer than 3 hours per day, 3 days per week for 3 weeks.⁸ This diagnosis is of no benefit to parents as there is little to offer in terms of treatment, leaving parents feeling under-supported and overwhelmed. The term "*Period of PURPLE Crying*" has been used as a replacement for the outdated "colic" as it encompasses the key aspects of what parents can expect from their infant with regards to crying.

The word “PURPLE” is an acronym for:

Peak of crying: your baby may cry more each week, the most in month 2, then less in months 3-5

Unexpected: crying can come and go and you don't know why

Resists soothing: your baby may not stop crying no matter what you try

Pain-like face: a crying baby may look like they are in pain, even when they are not

Long lasting: crying can last as much as 5 hours a day, or more

Evening: your baby may cry more in the late afternoon and evening

The word *Period* means that the crying has a beginning and an end.⁹

Such a simple message allows parents to understand that what their child is experiencing is not abnormal and that they are doing nothing wrong.

What studies have been carried out to test for the effectiveness of this program?

A study consisting of 20 hospitals in the New York State Hudson Valley region found that prior to implementation of an educational program for parents, there were 2.8 injuries associated with AHT per year. Following initiation of the program, this figure fell to 0.7 injuries per year, a reduction of 75%.¹⁰ Similar studies have also found reductions following implementation of parent education programs.¹¹ In addition to the reduction in AHT, other benefits included an increased awareness among parents of what to do when a baby is crying, with 93% of parents in one study rating the program as useful to them.¹²

Is the program cost-effective?

Apart from the benefits of child safety, for a program to be successfully implemented it must also be cost-effective to society. A 2019 study in British Columbia, Canada, completed an incidence-based cost-of-illness analysis of data collected over a 12 year period and found that an investment of just \$5 (€4.24) per newborn through the *Period of PURPLE Crying* program resulted in a \$273.52 (€231.87) per child cost avoidance by society and a \$14.49 (€12.28) per child cost avoidance by the healthcare system.¹³

Is the program acceptable to parents and medical personnel?

Simonnet et al found that parents regarded the intervention as acceptable and useful, while healthcare professionals such as paediatricians and nurses found that they could easily provide a short talk to parents during the newborn examination.¹⁴ It is evident then that the program is beneficial and acceptable to all of the stakeholders involved.

What is the next step?

Contact has already been made with the National Center on Shaken Baby Syndrome in Utah, USA about the possibility of implementing the *Period of PURPLE Crying* program in Ireland. This would first involve a pilot study being completed at Mullingar Regional Hospital comprising of nurses, midwives and doctors. The aim of the pilot study would include a review of the fit and feasibility of implementing the program in universal child health services in Ireland. The universal National Healthy Childhood Programme includes child health screening, developmental surveillance and immunisations. This universal service provides for parent contacts with a healthcare professional at least 25 times from pregnancy through to the child's third birthday.¹⁵ This programme already provides information and education on issues including child safety, breastfeeding, infant mental health, nutrition and so represents a logical platform through which to implement the Period of *PURPLE* Crying Program.

Conclusion/Recommendation

While it is evident that more research is needed in Ireland regarding exact figures of AHT, the effectiveness of the program in educating parents about infant crying and coping methods to deal with it cannot be ignored. With the incidence of AHT increasing in recent months, research-based educational programs such as *Period of PURPLE Crying* are needed to ensure that the most vulnerable members of society are adequately cared for. We, as clinicians, owe it to all the babies who suffered this horrific type of child abuse and to those who are at risk of suffering from it.

Acknowledgements:

We would like to express our deepest gratitude to Danielle Vázquez (Program Director, National Center on Shaken Baby Syndrome, Utah, USA) for her valuable and constructive suggestions during the research of this work. Her enthusiasm and willingness to support us from the beginning has been very much appreciated.

Declaration of Conflicts of Interest:

The authors have no conflicts of interest to declare.

Corresponding Author:

Dr Edmond Power,
University Hospital Limerick,
Dooradoyle,
Co. Limerick,
Ireland.
E-Mail: edmond.power@ucdconnect.ie

References:

1. Barr RG. Components of the Program [Web page]. 2020. Available from: <http://purplecrying.info/sub-pages/what-is-the-period-of-purple-crying/components-of-the-program.php>.
2. Sidpra J, Abomeli D, Hameed B, Baker J, Mankad K. Rise in the incidence of abusive head trauma during the COVID-19 pandemic. 2020.
3. I T, RC A, T T. Shaken baby syndrome and a baby's cry. *Acta paediatrica* (Oslo, Norway : 1992). 2008;97(6).
4. T J, MR H. Pediatric Abusive Head Trauma. 2020/
<https://www.ncbi.nlm.nih.gov/pubmed/29763011>
5. T S-H, S B, B S, RA B, RR vR. Educational paper: Abusive Head Trauma part I. Clinical aspects. *European journal of pediatrics*. 2012;171(3).
6. Mann AK, Rai B, Sharif F, Vavasseur C. Assessment of parental awareness of the shaken baby syndrome in Ireland. *European Journal of Pediatrics*. 2015;174(10):1339-45.
7. Akhnikh S, Engelberts A, Sleuwen B, Lhoir M, Benninga M. The Excessively Crying Infant: Etiology and Treatment. *Pediatric annals*. 2014;43:e69-75.
8. AK L, JF L. Infantile colic: a review. *The journal of the Royal Society for the Promotion of Health*. 2004;124(4).
9. What is the Period of PURPLE Crying? 2020. Available from: <http://www.purplecrying.info/what-is-the-period-of-purple-crying.php>.
10. Altman RL, Canter J, Patrick PA, Daley N, Butt NK, Brand DA. Parent Education by Maternity Nurses and Prevention of Abusive Head Trauma. 2011.
11. RG B, M B, F R, C H, I P, R B, et al. Eight-year outcome of implementation of abusive head trauma prevention. *Child abuse & neglect*. 2018;84.
12. TC S, D P, J G, DA T, MJ G, N P, et al. Shaken baby syndrome and a triple-dose strategy for its prevention. *The Journal of trauma*. 2011;71(6).
13. E B, F R, A Z, I P. The lifetime costs of pediatric abusive head trauma and a cost-effectiveness analysis of the Period of Purple crying program in British Columbia, Canada. *Child abuse & neglect*. 2019;97.
14. H S, A L-V, W Y, M H, S V, M B, et al. Parents' behavior in response to infant crying: abusive head trauma education. *Child abuse & neglect*. 2014;38(12).
15. The Nurture Programme - Infant Health & Wellbeing - HSE.ie: HSE.ie; 2020. Available from: <https://www.hse.ie/eng/health/child/nurture/intro.html>.