

## HER FOUNDATION PUBLISHES GROUNDBREAKING PEER-REVIEWED SCIENTIFIC RESEARCH ON HG 2007-2021

- In 2007, 15% of women reported therapeutic terminations of wanted pregnancies due to HG primarily because of no hope for relief and more often reported uncaring providers. (The rate is now 6% due in part to the education and support provided by HER). *Voluntary termination in a large cohort of women with hyperemesis gravidarum. Contraception. Dec;76(6):451-5(2007).*
- 26% of women report extreme weight loss (>15%) and 22% report symptoms lasting the entire pregnancy suggesting HG can be a form of prolonged starvation in pregnancy. *Symptoms and pregnancy outcomes associated with extreme weight loss among women with hyperemesis gravidarum. J Women's Health, Dec;18(12):1981-7 (2009).*
- HG runs in families suggesting a genetic component. If your sister has HG, you have a 17-fold increased risk of having it too. *Familial Aggregation of Hyperemesis Gravidarum. AJOG, Mar;204(3):230 (2011).*
- HG causes PTSD in 18% of women, especially when symptoms last the entire pregnancy. *Posttraumatic Stress Symptoms (PTSS) following Hyperemesis Gravidarum (HG) J Matern Fetal Neonatal Med. Nov;24(11):1307-11 (2011).*
- More than 80% of women who had HG in their 1<sup>st</sup> pregnancy reported having severe nausea and vomiting in their next pregnancy. *Recurrence Risk of Hyperemesis Gravidarum. J Midwifery and Women's Health. Mar-Apr;56(2):132-6 (2011).*
- Poor outcomes (primarily preterm births) are 4X more common in women with HG and are associated with gestational hypertension, early symptoms, and antihistamine use. *Antihistamines and other prognostic factors for adverse outcome in hyperemesis gravidarum. Eur J Obstet Gynecol Reprod Biol. Jun 7(2013).*
- Women with HG are at increased risk of having a child with neurodevelopmental delay including attention disorders, learning delay, sensory disorders, and speech and language delay. *Neurodevelopmental delay in children exposed in utero to hyperemesis gravidarum. Eur J Obstet Gynecol Reprod Biol.;189:79-84 (2015).*
- Data on 1070 HG pregnancies exposed to ondansetron reveals no evidence to support teratogenicity. Women with a history of HG who took ondansetron reported less miscarriages and terminations, and higher live birth rates. *Ondansetron in pregnancy and risk of adverse fetal outcomes in the United States. Reprod Toxicol. Jul;62:87-91(2016).*
- Summary of recent maternal deaths secondary to HG lead to urgent appeal for prompt testing and treatment followed by frequent follow-up with the patient until symptoms subside to prevent HG-related deaths in the future. *Why are women still dying from nausea and vomiting of pregnancy? Gynecology and Obstetrics Case Report. Insight Medical Publishing Journals (2016).*
- Sequencing of HG families identifies mutations in *RYR2*, an intracellular calcium release channel gene involved in vomiting, cyclic-vomiting syndrome, and a thyroid hormone target gene. *Genetic analysis of Hyperemesis Gravidarum reveals association with intracellular calcium release channel (RYR2). Molecular and Cellular Endocrinology, Mol Cell Endocrinol. 439:308-316. (2017).*
- Groundbreaking study shows the placenta, appetite, and cachexia hormone GDF15 likely plays a role in causing HG. *Placenta and appetite genes GDF15 and IGFBP7 are associated with hyperemesis gravidarum. Nature Communications 9, 1178 (2018).*



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- Along with larger studies, this study adds to mounting evidence that HG increases risk for having a child diagnosed with autism. *Analysis of neurodevelopmental delay in children exposed in utero to hyperemesis gravidarum reveals increased risk of autism spectrum disorder. Repro Toxicol, 84:59-64 (2019).*
- GDF15 hormone levels are abnormally high in HG pregnancies, providing more evidence GDF15 may cause HG. *Analysis of GDF15 and IGFBP7 in Hyperemesis Gravidarum support causality. Geburtshilfe und Frauenheilkunde;79(4):382-388 (2019).*
- The free iPhone App developed by HER and UCLA improves patient-provider communication and care. *Performance of iPhone Hyperemesis Gravidarum Care App. Norcal Publications (2019).*
- Article summarizing the state of knowledge published in one of the most highly respected international journals includes tables and figures provided by HER. *Nausea and vomiting of pregnancy and hyperemesis gravidarum. Nature Reviews Disease Primers, (2019).*
- This study validates a new and greatly needed tool designed by HER to measure severity of HG. *HyperEmesis Level Prediction identifies patients with indicators of severe disease: a validation study. Geburtshilfe und Frauenheilkunde, (2021).*

**NOTE: Access FULL TEXT articles on [www.hyperemesis.org/research](http://www.hyperemesis.org/research).**



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**FULL LIST: HER FOUNDATION PUBLISHES GROUNDBREAKING  
PEER-REVIEWED SCIENTIFIC PROGRESS ON HG 2007-2021**

**Voluntary termination in a large cohort of women with hyperemesis gravidarum. Contraception. Dec;76(6):451-5(2007).**

**Psychosocial Burden of Hyperemesis Gravidarum. American Journal of Perinatology. Mar;28(3):176-81 (2008).**

**Secular trends in the treatment of hyperemesis gravidarum. Am J Perinatol. Mar;25(3):141-7 (2008).**

**High prevalence of severe nausea and vomiting of pregnancy and hyperemesis gravidarum among relatives of affected individuals. Eur J Obstet Gynecol Reprod Biol. Nov;141(1):13-7 (2008).**

**Symptoms and pregnancy outcomes associated with extreme weight loss among women with hyperemesis gravidarum. J Women's Health, Dec;18(12):1981-7 (2009).**

**Patients with history of hyperemesis gravidarum have similar symptoms during egg stimulation and develop ovarian hyperstimulation syndrome: case series. Fertility and Sterility, Oct Jan;93(1):267 (2010).**

**Familial Aggregation of Hyperemesis Gravidarum. AJOG, Mar;204(3):230 (2011).**

**Posttraumatic Stress Symptoms (PTSS) following Hyperemesis Gravidarum (HG) J Matern Fetal Neonatal Med. Nov;24(11):1307-11 (2011).**

**Recurrence Risk of Hyperemesis Gravidarum. J Midwifery and Women's Health. Mar-Apr;56(2):132-6 (2011).**

**Prenatal Exposure to Hyperemesis Gravidarum Linked to Increased Risk of Psychological and Behavioral Disorders in Adulthood. J Dev Origins of Disease, 2:200-204 (2011).**

**Risk Factors, Treatments, and Outcomes Associated with Prolonged Hyperemesis Gravidarum (HG) J Matern Fetal Neonatal Med. Jun;25(6):632-6 (2012).**

**Change in paternity and recurrence of hyperemesis gravidarum. J Matern Fetal Neonatal Med., 25(8):1241-5 (2012).**

**No increased Risk of Psychological/Behavioral Disorders in Siblings of Women with Hyperemesis Gravidarum unless their Mother had HG. J Dev Origins of Disease, 3(5):375-379 (2012).**

**Antihistamines and other prognostic factors for adverse outcome in hyperemesis gravidarum. Eur J Obstet Gynecol Reprod Biol. Jun 7(2013).**

**Psychiatric factors do not affect recurrence risk of Hyperemesis Gravidarum. JOGR, 41(4):512-16 (2015).**

**Neurodevelopmental delay in children exposed in utero to hyperemesis gravidarum. Eur J Obstet Gynecol Reprod Biol.;189:79-84 (2015).**

**Frequency of intestinal obstruction in pregnancies exposed to ondansetron. Reproductive Toxicology, Nov;57:207(2015).**

**Mortality secondary to Hyperemesis Gravidarum: a case report. Women's Health and Gynecology, (2015).**



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**Long-term health effects in children exposed in-utero to hyperemesis gravidarum. Clinical Obstetric, Gynecology and Reproduction. 2(2): 150-154 (2016).**

**Ondansetron in pregnancy and risk of adverse fetal outcomes in the United States. Reprod Toxicol. Jul;62:87-91(2016).**

**Why are women still dying from nausea and vomiting of pregnancy? Gynecology and Obstetrics Case Report. Insight Medical Publishing Journals (2016).**

**Analysis of pre- and post-pregnancy issues in women with hyperemesis gravidarum. Autonomic Neuroscience, Basic and Clinical, 202:73-78.(2017).**

**Genetic analysis of Hyperemesis Gravidarum reveals association with intracellular calcium release channel (RYR2). Molecular and Cellular Endocrinology, Mol Cell Endocrinol. 439:308-316. (2017).**

**Measures of depression and anxiety in women with hyperemesis gravidarum are flawed. Invited Commentary on the article entitled "Mitchell-Jones N, Gallos I, Farren J, et al. Psychological morbidity associated with hyperemesis gravidarum: a systematic review and meta-analysis. BJOG. Jan;124(1):20-30. Evidence-based Nursing (2017).**

**Placenta and appetite genes *GDF15* and *IGFBP7* are associated with hyperemesis gravidarum. Nature Communications 9, 1178 (2018).**

**Evidence *GDF15* plays role in familial and recurrent hyperemesis gravidarum. Geburtshilfe und Frauenheilkunde, 78(9):866-870 (2018).**

**Analysis of neurodevelopmental delay in children exposed in utero to hyperemesis gravidarum reveals increased risk of autism spectrum disorder. Reproductive Toxicology, 84:59-64 (2019).**

**Analysis of *GDF15* and *IGFBP7* in Hyperemesis Gravidarum support causality. Geburtshilfe und Frauenheilkunde;79(4):382-388 (2019).**

**Performance of iPhone Hyperemesis Gravidarum Care App. Norcal Publications (2019).**

**Nausea and vomiting of pregnancy and hyperemesis gravidarum. Nature Reviews Disease Primers, (2019).**

**Core outcome set for Hyperemesis Gravidarum studies is a small step in the right direction. (invited Mini-commentary on BJOG-19-1332). BJOG (2020).**

**Hyperemesis Gravidarum: Strategies to improve outcomes. Journal of Infusion Nursing; March/April 43(2):78-96 (2020).**

**HyperE-mesis Level Prediction (HELP) Score identifies patients with indicators of severe disease: a validation study. Geburtshilfe und Frauenheilkunde, (2021).**



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