CURRENT RESEARCH IN OBSTETRICS AND GYNECOLOGY
INVESTIGACIÓN RECIENTE EN OBSTETRICIA Y GINECOLOGÍA

1. Expert Extraordinary Professor, Faculty of Medicine, Universidad Nacional Mayor de San Marcos, Lima, Peru
2. Editor, The Peruvian Journal of Gynecology and Obstetrics
3. ORCID iD 0000-0002-3168-6717

Conflicts of interest: None with the present publication.

Received: 18 September 2017

Accepted: 16 October 2017

Correspondence:
✉ jpachecoperu@yahoo.com

Citar como: Pacheco-Romero J. Current research obstetrics and gynecology. Rev Peru Ginecol Obstet. 2017;63(4):651-658

Current research in obstetrics and gynecology
Investigación reciente en obstetricia y ginecología

José Pacheco-Romero, MD, PhD, MSc, FACOG[1,2,3]

ABSTRACT

Research within the specialties of Obstetrics and Gynecology is impacting, and tries to solve many of today's clinical problems. In these pages, we present summaries of abstracts of current research published in institutional documents and in important magazines of our specialty. References are included.

Keywords: Obstetrics and Gynecology, Research, Summaries.

RESUMEN

La investigación en la especialidad de obstetricia y ginecología es impactante y permite conocer lo que nos puede ayudar a resolver algunos de los problemas clínicos actuales. Presentamos en inglés en estas páginas algunos resúmenes de resúmenes de investigación reciente aparecida en documentos institucionales y en revistas importantes de nuestra especialidad, con las referencias bibliográficas respectivas.

Palabras clave. Obstetricia y Ginecología, Investigación, Resúmenes.

Infertility

Emerging additive manufacturing techniques enable investigation of the effects of pore geometry on cell behavior and function. A bioprosthetic ovary created using 3D printed microporous scaffolds restores ovarian function in sterilized mice[1].

A comprehensive meta-regression analysis reports a significant decline in sperm counts (as measured by sperm concentration and total sperm count) between 1973 and 2011, driven by a 50-60% decline among men unselected by fertility from North America, Europe, Australia and New Zealand. Because of the significant public health implications of these results, research on the causes of this continuing decline is urgently needed[2].

Contraception

A recent Committee Opinion article from ACOG sates that in 2015, the birth rate among U.S. adolescents and young adults (aged 15–19 years) reached a historic low at 22.3 per 1 000 women. Despite positive trends, the United States continues to have the highest adolescent pregnancy rate among industrialized countries with data. Dual method use—the use of condoms in combination with more effective contraceptive methods to protect against sexually transmitted infections and unwanted pregnancy—is the ideal contraceptive practice for adolescents[3].

Pregnancy, Labor & Delivery

The Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Fetal Growth Studies-Singletons was a prospective cohort study that recruited women in four self-reported racial-ethnic groups-non-Hispanic black, Hispanic, non-Hispanic white, and Asian-with singleton gestations from 12 U.S. centers (2009-2013). Women with a certain last menstrual period confirmed by first-trimester ultrasonogram had longitudinal fetal measurements by credentialed study ultrasonographers blinded to the gestational age at their five follow-up visits. The new formula estimated the gestational age (±2 SD) within ±7 days from 14 to 20 weeks of gestation, ±10 days from 21 to 27 weeks of gestation, and ±17 days from 28 to 40 weeks of gestation. The NICHD gestational age estimation formula is associated with smaller errors than a well-established historical formula. Racial and ethnic-specific formulas are not superior to a racial-ethnic-neutral one[4].

Skeletal muscle physiology suggests that glucose supplementation might improve muscle performance in case of prolonged exercise and this situation is analogous to the gravid uterus during delivery. In a clinical study, a total of 193 patients (96 in the dextrose with normal saline [NS+D] group and 97 in the normal saline group [NS] were analysed in the study. The median total duration of labor was significantly less in the NS+D group (499 versus 423 minutes, p = 0.024) than in the NS group. There was no difference in the rate of caesarean section, instrumented delivery, Apgar score or arterial cord pH. Glucose supplementation significantly reduced the total length of labor without increasing the rate of complication in induced nulliparous women[5].

Severe maternal morbidity – Maternal mortality

One of the United Nations' Millennium Development Goals of 2000 was to reduce maternal mortality by 75% in 15 years; this challenge was not met by many industrialized countries. In a population-based retrospective cohort study, in women residing in Washington State, US, 2003–2013 (n = 828 269), severe maternal morbidity was significantly higher among teenage mothers than among those 25–29 y and increased exponentially with maternal age over 39 y. The elevated risk of severe morbidity among teen mothers disappeared after adjustment for confounders, except for maternal sepsis. Older women (≥40 y) had significantly elevated rates of some of the most severe, potentially life-threatening morbidities, including renal failure, shock, acute cardiac morbidity, serious complications of obstetric interventions, and ICU admission[6].

Since the Pregnancy Mortality Surveillance System was implemented, the number of reported pregnancy-related deaths in the United States steadily increased from 7.2 deaths per 100 000 live births in 1987 to a high of 17.8 deaths per 100 000 live births in 2009 and 2011 (2013 is the latest available year of data). The reasons are unclear. Many studies show that an increasing number of pregnant women in the United States have chronic health conditions such as hypertension,

diabetes, and chronic heart disease. The higher pregnancy-related mortality ratios during 2009–2011 are due to an increase in infection and sepsis deaths. The pregnancy-related deaths in the United States during 2011–2013 were caused by: cardiovascular diseases, 15.5%; non-cardiovascular diseases, 14.5%; infection or sepsis, 12.7%; hemorrhage, 11.4%; cardiomyopathy, 11.0%; thrombotic pulmonary embolism, 9.2%; hypertensive disorders of pregnancy, 7.4%; cerebrovascular accidents, 6.6%; amniotic fluid embolism, 5.5%.; anesthesia complications, 0.2%[7].

The perinatal suicide rate for Ontario during the period 1994–2008 was comparable to international estimates and represents a substantial component of Canadian perinatal mortality. Given that deaths by suicide occur throughout the perinatal period, all health care providers must be collectively vigilant in assessing risk[8].

Preeclampsia – Pregnancy hypertension

The acute trigger for the onset of preeclampsia is not fully understood. Once preeclampsia is triggered, there is an ensuing cascade of vascular and endothelial dysfunction, inflammation, and coagulation dysfunction that can in turn lead to neurologic, cardiac, pulmonary, renal, and hepatic disease in pregnant women[9]. Although not distinct entities, it is increasingly becoming apparent that early-onset or preterm preeclampsia is especially associated with poor placentation, fetal growth restriction, and worse long-term maternal cardiovascular outcomes than late-onset preeclampsia, whose pathogenesis is more related to predisposing cardiovascular or metabolic risks for endothelial dysfunction[10].

In a multicenter, double-blind, placebo-controlled trial, 1 776 women with singleton pregnancies who were at high risk for preterm preeclampsia were randomly assigned to receive aspirin, at a dose of 150 mg per day, or placebo from 11 to 14 weeks of gestation until 36 weeks of gestation. Treatment with low-dose aspirin in women at high risk for preterm preeclampsia resulted in a lower incidence of this diagnosis than placebo (1.6% compared with 4.3% in the placebo group)[11].

Pregnant women or women in the postpartum period with acute-onset, severe systolic hypertension, severe diastolic hypertension, or both require urgent antihypertensive therapy. Treatment with first-line agents should be expeditious and occur as soon as possible within 30-60 minutes of confirmed severe hypertension to reduce the risk of maternal stroke. Intravenous labetalol and hydralazine have been considered first-line medications. The available evidence suggests that immediate release oral nifedipine also may be considered as a first-line therapy. When these drugs fail to relieve acute-onset, severe hypertension, emergent consultation with an anesthesiologist, maternal-fetal subspecialist, or critical care subspecialist to discuss second-line intervention is recommended[12].

In a 399 cohort of women with preeclampsia and severe features before delivery, nonsteroidal antiinflammatory drugs (NSAIDs) were not associated with increased rates of persistent postpartum hypertension[13].

High blood pressure during pregnancy has long been linked to greater odds of redeveloping the condition in middle age, but a new study suggests that the increased risk may exist soon after delivery and persist for decades. Women who had common blood pressure problems like preeclampsia and gestational hypertension during their first pregnancy had 12 to 25 times higher odds of having elevated blood pressure in the first year after delivery than women who had normal blood pressure during pregnancy. Over the first decade after delivery, women with high blood pressure during pregnancy had 10 times higher chances of developing chronic hypertension[14].

Misoprostol regimes

A very important FIGO publication for obstetricians-gynecologists is that referred to misoprostol alone recommended regimes 2017. It classifies pregnancies according to gestational age (less than 13 weeks, 13-26 weeks, over 26 weeks, and post partum) and to obstetrical indication (interruption of pregnancy, incomplete abortion, inevitable abortion, cervical maturation for surgical abortion, retained abortion, fetal death, delivery induction, and prevention and treatment of post partum hemorrhage). It can be obtained in Spanish[15].

Infections - Sexually transmitted diseases

Sexually transmitted diseases (STDs) have long been an underestimated opponent in the public health battle. A 1997 Institute of Medicine (IOM) report described STDs as, "hidden epidemics of tremendous health and economic consequence in the United States," and stated that the "scope, impact, and consequences of STDs are underrecognized by the public and healthcare professionals." Since well before this report was published, and nearly two decades later, those facts remain unchanged. It is estimated that there are 20 million new STDs in the U.S. each year, and half of these are among young people ages 15 to 24 years. Across the nation, at any given time, there are more than 110 million total (new and existing) infections. These infections can lead to long-term health consequences, such as infertility; they can facilitate HIV transmission; and they have stigmatized entire subgroups of Americans[16].

The World Health Organization (WHO) Global Gonococcal Antimicrobial Surveillance Programme (GASP) is key to monitoring antimicrobial resistance (AMR) trends, identifying emerging AMR, and informing regular refinements of treatment guidelines and public health policy globally. In vitro and clinical resistance in *N. gonorrhoeae* to the extended-spectrum cephalosporins (ESCs), the last-line treatment for gonorrhea, have been reported from many, particularly well-resourced, settings globally. Enhanced international collaborative actions are crucial for the control of gonorrhea[17].

Syphilis rates are increasing among women and their babies, and men throughout the United States. Untreated syphilis can cause severe medical issues. Efforts are needed to create new tools to detect and treat syphilis, increase testing, control the further spread of syphilis, and improve electronic medical records in order to improve patient outcomes[18].

Research suggests Zika virus targets specific $CD14^{+}$ monocytes in a pregnant woman's immune system, enabling the virus to spread and increasing the chances of harm to unborn babies. A classical/intermediate monocyte-mediated M1-skewed inflammation by the African-lineage ZIKV infection was observed, in contrast to a non-classical monocyte-mediated M2-skewed immunosuppression by the Asian-lineage ZIKV infection. Because pregnant women are more prone to immune suppression, the Zika virus exploits that weakness to infect and replicate, stifling a body's natural defenses in a way that resembles HIV[19].

Zika virus RNA is frequently detected in the semen of men after Zika virus infection. To learn more about persistence of viruses in genital fluids, PubMed was searched for relevant articles. This search returned 3 818 results. Titles, abstracts, and full text articles were screened for data that described detection of viruses in semen by nucleic acid amplification or detection, antigen detection, replication in cell culture, or replication in an animal system. 27 viruses, across a broad range of virus families, can be found in human semen, viruses that are capable of causing viremia[20].

Zika virus RT-PCR testing of placental and fetal tissue specimens can provide a confirmed diagnosis of recent maternal Zika virus infection[21].

Antibiotics

Use of certain antibiotics early in pregnancy is associated with an increased risk for spontaneous abortion. Macrolides (except erythromycin), quinolones, tetracyclines, sulfonamides, and metronidazole all were associated with a greater risk, compared with penicillins, cephalosporins, or no antibiotic exposure at all[22].

Menopause

Premenopausal unilateral oophorectomy (UO) significantly reduces the age of menopause by 1.8 years. Younger age at UO leads to significantly younger age at menopause[23].

In older women, depressive symptoms are common and are associated with social and financial insecurity, and with vasomotor symptoms[24].

Hormone therapy (HT) remains the most effective treatment for vasomotor symptoms (VMS) and the genitourinary syndrome of menopause (GSM) and has been shown to prevent bone loss and fracture. The risks of HT differ depending on type, dose, duration of use, route of administration, timing of initiation, and whether a progestogen is used. For women aged younger than

60 years or who are within 10 years of menopause onset and have no contraindications, the benefit-risk ratio is most favorable for treatment of bothersome VMS and for those at elevated risk for bone loss or fracture. For women who initiate HT more than 10 or 20 years from menopause onset or are aged 60 years or older, the benefit-risk ratio appears less favorable because of the greater absolute risks of coronary heart disease, stroke, venous thromboembolism, and dementia. Longer durations of therapy should be for documented indications such as persistent VMS or bone loss, with shared decision making and periodic reevaluation. For bothersome GSM symptoms not relieved with over-the-counter therapies and without indications for use of systemic HT, low-dose vaginal estrogen therapy or other therapies are recommended[25].

Meeting American Heart Association - AHA recommendations for moderate activity (moderate, >150 minutes/week; strenuous, >75 minutes/week) had a protective effect for reducing ischemic stroke risk. Participants who met AHA recommendations at baseline but not at follow-up, however, were not afforded reduced stroke risk [26].

Health outcomes from the Women's Health Initiative Estrogen Plus Progestin and Estrogen-Alone Trials have been reported, but previous publications have generally not focused on all-cause and cause-specific mortality. Among postmenopausal women, hormone therapy with conjugated equine estrogens (CEE, 0.625mg/d) plus medroxyprogesterone acetate (MPA, 2.5mg/d) (n = 8 506) vs. placebo (n = 8 102) for a median of 5.6 years or with CEE alone for a median of 7.2 years was not associated with risk of all-cause, cardiovascular, or cancer mortality during a cumulative follow-up of 18 years[27].

Chronological resistance arterial aging is a prominent factor leading to weakened vasodilatory action of estrogenic compounds[28].

In menopausal women with endothelial dysfunction, menopausal transition is associated with increased carotid arterial stiffness and epicardial fat thickness, independent of age. Ultrasound measured epicardial fat was a better independent predictor of arterial stiffness than carotid intima media thickness in these women[29].

In postmenopausal women, high BMI and abdominal obesity are sources of sleep disturbances, decreasing deep sleep, and sleep efficiency, while increasing the risk of obstructive sleep apnea[30].

Cancer in women

The study of 4 285 African-American and white women from New York and New Jersey has found a significant increase in breast cancer risk among black women who used dark shades of hair dye and white women who used chemical relaxers. Black women who reported using dark hair dye had a 51 percent increased risk of breast cancer compared to black women who did not, while white women who reported using chemical relaxers had a 74 percent increased risk of breast cancer. The risk of breast cancer was even higher for white women who regularly dyed their hair dark shades and also used chemical relaxers, and it more than doubled for white dual users compared to white women who used neither dark dye nor chemical straighteners[31].

Recent cervical cancer screening guideline changes in Ontario were associated with reduced chlamydia testing and reported new cases of chlamydia in females. Females aged 15 to 19 years, who are at high risk for chlamydia if sexually active, and who no longer warrant cervical cancer screening, were disproportionately affected. Females should be tested for chlamydia based on risk, regardless of need for Pap testing[32].

Analysis from 17 studies participating in the Epidemiology of Endometrial Cancer Consortium that included 8 981 women with endometrial cancer and 17 241 women in a control group, ever breastfeeding was associated with an 11% reduction in risk of endometrial cancer. The longer average duration of breastfeeding per child was associated with lower risk of endometrial cancer, although there appeared to be some leveling of this effect beyond 6-9 months[33].

Between 1990 and 2008, 535 melanoma, 247 squamous-cell carcinoma (SCC), and 1 712 basal-cell carcinoma (BCC) cases were ascertained. Endometriosis was associated with an increased overall risk of skin cancer (HR 1.28, 95% CI 1.05-1.55). The association was strongest for melanoma[34].

Neonatology - Prematurity

A recent randomized clinical trial of women at 34 weeks to 36 weeks and 5 days of gestation who were at high risk for late preterm delivery demonstrated that administration of antenatal corticosteroids significantly reduced the rate of neonatal respiratory complications[35].

In 5 504 cases of birth defects in children born 2005-09 to Utah's resident women among 270 878 births (prevalence 2.03%), excluding mild isolated conditions (such as muscular ventricular septal defects, distal hypospadias), definite cause was assigned in 20.2% (n=1 114) of cases: chromosomal or genetic conditions accounted for 94.4% (n=1 052), teratogens for 4.1% (n=46, mostly poorly controlled pregestational diabetes), and twinning for 1.4% (n=16, conjoined or acardiac). The 79.8% (n=4 390) remaining were classified as unknown etiology; of these 88.2% (n=3 874) were isolated birth defects. Family history (similarly affected first degree relative) was documented in 4.8% (n=266). In this cohort, 92.1% (5067/5504) were live born infants (isolated and non-isolated birth defects): 75.3% (4 147/5 504) were classified as having an isolated birth defect (unknown or known etiology). These findings underscore the gaps in our knowledge regarding the causes of birth defects. For the causes that are still unknown, better strategies are needed[36].

Siblings born after a normotensive pregnancy had nearly identical risk factor levels as siblings born after maternal hypertension. Offspring born after maternal hypertension in pregnancy have a more adverse cardiovascular risk profile in young adulthood than offspring of normotensive pregnancies. Their siblings, born after a normotensive pregnancy, have a similar risk profile, suggesting that shared genes or lifestyle may account for the association, rather than an intrauterine effect. All children of mothers who have experienced hypertension in pregnancy may be at increased lifetime risk of cardiovascular disease[37].

All pregnant women should avoid Zika virus exposure. Because the full clinical spectrum of congenital Zika virus infection is not yet known, all infants born to women with laboratory evidence of possible recent Zika virus infection during pregnancy should receive postnatal neuroimaging and Zika virus testing in addition to a comprehensive newborn physical exam and hearing screen. Identification and follow-up care of infants born to women with laboratory evidence of possible recent Zika virus infection during pregnancy and infants with possible congenital Zika virus infection can ensure that appropriate clinical services are available[38].

Pregnant women living in or traveling to areas with local mosquito-borne Zika virus transmission are at risk for Zika virus infection, which can lead to severe fetal and infant brain abnormalities and microcephaly. During January 1, 2016-April 25, 2017, U.S. territories with local transmission of Zika virus reported 2 549 completed pregnancies (live births and pregnancy losses at any gestational age) with laboratory evidence of recent possible Zika virus infection; 5% of fetuses or infants resulting from these pregnancies had birth defects potentially associated with Zika virus infection. Among completed pregnancies with positive nucleic acid tests confirming Zika infection identified in the first, second, and third trimesters, the percentage of fetuses or infants with possible Zika-associated birth defects was 8%, 5%, and 4%, respectively. Among liveborn infants, 59% had Zika laboratory testing results reported to the pregnancy and infant registries. Identification and follow-up of infants born to women with laboratory evidence of recent possible Zika virus infection during pregnancy permits timely and appropriate clinical intervention services[39].

Breastfeeding

During 8 years of follow-up, 16 671 incident cases of coronary heart disease and 23 983 cases of stroke were recorded among 289 573 women without prior CVD at baseline, in the nationwide China Kadoorie Biobank. A history of breastfeeding was associated with a +10% lower risk of cardiovascular disease in later life and the magnitude of the inverse association was stronger among those with a longer duration of breastfeeding[40].

Blood transfusions

A cohort of 31 118 patients (median age, 65 [interquartile range, 42-77] years; 52% female) who received 59 320 red blood cell transfusions exclusively from 1 of 3 types of donors (88% male; 6% ever-pregnant female; and 6% never-pregnant

female) at 6 major Dutch hospitals is reported. The number of deaths in this cohort was 3 969 (13% mortality). Among patients who received red blood cell transfusions, receipt of a transfusion from an ever-pregnant female donor, compared with a male donor, was associated with increased all-cause mortality among male recipients but not among female recipients. Transfusions from never-pregnant female donors were not associated with increased mortality among male or female recipients[41].

References

1. Laronda MM, Rutz AL, Xiao S, Whelan KA, Duncan FE, Roth EW, Woodruff TK, Shah RN. A bioprosthetic ovary created using 3D printed microporous scaffolds restores ovarian function in sterilized mice. Nature Communications 8, Article number: 15261 (2017). doi:10.1038/ncomms15261.
2. Levine H, Jørgensen N, Martino-Andrade A, Mendiola J, Weksler-Derri D, Mindlis I, Pinotti R, Swan SH. Temporal trends in sperm count: a systematic review and meta-regression analysis. Hum Reprod Update. 2017 Jul 25:1-14. doi: 10.1093/humupd/dmx022. [Epub ahead of print].
3. The American College of Obstetricians and Gynecologists. Committee Opinion Number 699, May 2017. Adolescent pregnancy, contraception, and sexual activity. https://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Adolescent-Health-Care/Adolescent-Pregnancy-Contraception-and-Sexual-Activity.
4. Skupski DW, Owen J, Kim S, Fuchs KM, Albert PS, Grantz KL; Eunice Kennedy Shriver National Institute of Child Health and Human Development Fetal Growth Studies. Estimating gestational age from ultrasound fetal biometrics. Obstet Gynecol. 2017 Aug;130(2):433-41. doi: 10.1097/AOG.0000000000002137.
5. Paré J, Pasquier J-C, Lewin A, Fraser W, Bureau Y-A. Reduction of total labour length through the addition of parenteral dextrose solution in induction of labor in nulliparous: results of DEXTRONS prospective randomized controlled trial, Am J Obstet Gynecol. 2017, doi: 10.1016/j.ajog.2017.01.010.
6. Lisonkova S, Potts J, Muraca GM, Razaz N, Sabr Y, Chan W-S, Kramer MS. Maternal age and severe maternal morbidity: A population-based retrospective cohort study. PLOS Medicine. May 30, 2017. https://doi.org/10.1371/journal.pmed.1002307.
7. Centers for Disease Control and Prevention. Reproductive Health. Pregnancy mortality surveillance system. https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html.
8. Grigoriadis S, Wilton AS, Kurdyak PA, Rhodes AE, VonderPorten EH, Levitt A, Cheung A, Vigod SN. Perinatal suicide in Ontario, Canada: a 15-year population-based study. CMAJ August 28, 2017;189(34). doi: 10.1503/cmaj.170088.
9. Parich NI, Gonzalez J. Preeclampsia and hypertension. Courting a long while: time to make it official. Editorial. JAMA Intern Med. Apr 25, 2017:E1-E2. doi:10.1001/jamainternmed.2017.1422.
10. Melchiorre K, Sharma R, Thilaganathan B. Cardiovascular implications in preeclampsia. Circulation. Aug 19, 2014;130(8):703-14. https://doi.org/10.1161/CIRCULATIONAHA.113.003664.
11. Rolnik DL, Wright D, Poon LC, O'Gorman N, Syngelaki A, de Paco Matallana C, et al; Nicolaides KH. Aspirin versus placebo in pregnancies at high risk for preterm preeclampsia. NEJM. June 28, 2017. DOI: 10.1056/NEJMoa1704559.
12. The American College of Obstetricians and Gynecologists. Committee Opinion Number 692, April 2017. Emergent therapy for acute-onset, severe hypertension during pregnancy and the postpartum period. Obstet Gynecol. 2017:129:e90–5.
13. Viteri OA, England JA, Alrais MA, Lash KA, Villegas MI, Ashimi Balogun OA, Chauhan SP, Sibai BM. Association of nonsteroidal antiinflammatory drugs and postpartum hypertension in women with preeclampsia with severe features. Obstet Gynecol. 2017 Oct;130(4):830-5. doi: 10.1097/AOG.0000000000002247.
14. Rapaport L. High blood pressure in pregnancy may return before middle age. Reuters Health News. http://www.reuters.com/article/us-health-pregnancy-hypertension-idUSKBN1A62AL.
15. FIGO. Misoprostol solo: regímenes recomendados 2017. http://www.figo.org/sites/default/files/uploads/project-publications/Miso/FIGO_Dosage_Chart_SPA.pdf.
16. Centers for Disease Control and Prevention. 2016 Sexually Transmitted Diseases Surveillance. https://www.cdc.gov/std/stats16/toc.htm.
17. Lahra MM, Ndowa F, Bala M, Dillon J-AR, Ramon-Pardo P, Eremin SR, Bolan G, Unemo M. Antimicrobial resistance in Neisseria gonorrhoeae: Global surveillance and a call for international collaborative action. PLoS Med. 2017;14(7):e1002344. https://doi.org/10.1371/journal.pmed.1002344.
18. CDC Call to Action. Let's work together to stem the tide of rising syphilis in the United States. Apr 2017:12 pp. https://www.cdc.gov/std/syphilis/syphiliscalltoactionapril2017.pdf.
19. Foo SS, Chen W, Chan Y, Bowman JW, Chang LC, Choi Y, et al. Asian Zika virus strains target CD14+ blood monocytes and induce M2-skewed immunosuppression during pregnancy. Nat Microbiol. 2017 Aug 21. doi: 10.1038/s41564-017-0016-3. [Epub ahead of print].
20. Salam AP, Horby PW. The breadth of viruses in human semen. Centers for Disease Control and Prevention. Emerging Infectious Diseases. 2017 Nov;23(11):1922-4. doi:10.3201/eid2311.171049.
21. Reagan-Steiner S, Simeone R, Simon E, Bhatnagar J, Oduyebo T, Free R. Evaluation of placental and fetal tissue specimens for Zika virus infection - 50 states and District of Columbia, January-December, 2016. MMWR Morb Mortal Wkly Rep. 2017 Jun 23;66(24):636-43. doi: 10.15585/mmwr.mm6624a3.
22. Muanda FT, Sheehy O, Bérard A. Use of antibiotics during pregnancy and risk of spontaneous abortion. CMAJ. May 1, 2017;109(17). doi: 10.1503/cmaj.161020.
23. Rosendahl M, Simonsen MK, Kjer JJ. The influence of unilateral oophorectomy on the age of menopause. Climacteric. 2017 Sep 21:1-5. doi: 10.1080/13697137.2017.1369512. [Epub ahead of print].

24. Zeleke BM, Bell RJ, Billah B, Davis SR. Vasomotor symptoms are associated with depressive symptoms in community-dwelling older women. Menopause. 2017 Jun 19. doi: 10.1097/GME.0000000000000938. [Epub ahead of print].

25. The 2017 hormone therapy position statement of The North American Menopause Society. Menopause. 2017 Jul;24(7):728-53. doi: 10.1097/GME.0000000000000921.

26. Willey JZ, Voutsinas J, Sherzai A, Ma H, Bernstein L, Elkind MSV, Cheung YK, Wang SS. Trajectories in leisure-time physical activity and risk of stroke in women in the California teachers study. Stroke. 2017 Sep;48(9):2346-52. doi: 10.1161/STROKEAHA.117.017465.

27. Manson JAE, Aragaki AK, Rossouw JE, Anderson GL, Wactawski-Wende L; for the WHI Investigators. Menopausal hormone therapy and long-term all-cause and cause-specific mortality The Women's Health Initiative randomized trials. JAMA. 2017;318(10):927-38. doi:10.1001/jama.2017.11217.

28. Nicholson CJ, Sweeney M, Robson SC, Taggart MJ. Estrogenic vascular effects are diminished by chronological aging. Sci Rep. 2017 Sep 22;7(1):12153. doi: 10.1038/s41598-017-12153-5.

29. Cabrera-Rego JO, Navarro-Despaigne D, Staroushik-Morel L, Díaz-Reyes K, Lima-Martínez MM, Iacobellis G. Association between endothelial dysfunction, epicardial fat and sub-clinical atherosclerosis during menopause. Clin Investig Arterioscler. 2017 Sep 19. pii: S0214-9168(17)30092-X. doi: 10.1016/j.arteri.2017.07.006. [Epub ahead of print].

30. Naufel MF, Frange C, Andersen ML, Girão MJBC, Tufik S, Beraldi Ribeiro E, Hachul H. Association between obesity and sleep disorders in postmenopausal women. Menopause. 2017 Sep 18. doi: 10.1097/GME.0000000000000962. [Epub ahead of print].

31. Llanos AAM, Rabkin A, Bandera EV, Zirpoli G, Gonzalez BD, Xing CY, et al. Hair product use and breast cancer risk among African American and White women. Carcinogenesis, 09 June 2017, bgx060. https://doi.org/10.1093/carcin/bgx060.

32. Naimer MS, Kwong JC, Bhatia D, Moineddin R, Whelan M, Campitelli MA, Macdonald L, Lofters A, Tuite A, Bogler T, Permaul JA, McIsaac WJ. The effect of changes in cervical cancer screening guidelines on chlamydia testing. Ann Fam Med. 2017 Jul;15(4):329-34. doi: 10.1370/afm.2097.

33. Jordan SJ, Na R, Johnatty SE, Wise LA, Adami HO, Brinton LA, Chen C, et al. Breastfeeding and endometrial cancer risk: An analysis from the Epidemiology of Endometrial Cancer Consortium. Obstet Gynecol. 2017 Jun;129(6):1059-67. doi: 10.1097/AOG.0000000000002057.

34. Farland LV, Lorrain S, Missmer SA, Dartois L, Cervenka I, Savoye I, Mesrine S, Boutron-Ruault MC, Kvaskoff M. Endometriosis and the risk of skin cancer: a prospective cohort study. Cancer Causes Control. 2017 Aug 10. doi: 10.1007/s10552-017-0939-2. [Epub ahead of print].

35. Egeland GM, Klungsøyr K, Øyen N, Tell GS, Næss Ø, Skjærven R. Preconception cardiovascular risk factor differences between gestational hypertension and preeclampsia: Cohort Norway Study. Hypertension. 2016;67(6):1173-80.

36. Feldkamp ML, Carey JC, Byrne JLB, Krikov S, Botto LD. Etiology and clinical presentation of birth defects: population based study. BMJ. 2017;357.j2249. doi: https://doi.org/10.1136/bmj.j2249.

37. Alsnes IV, Vatten LJ, Fraser A, Bjørngaard JH, Rich-Edwards J, Romundstad PR, Åsvold BO. Hypertension in pregnancy and offspring cardiovascular risk in young adulthood: prospective and sibling studies in the HUNT Study (Nord-Trøndelag Health Study) in Norway. Hypertension. 2017 Apr;69(4):591-8. doi: 10.1161/HYPERTENSIONAHA.116.08414.

38. Reagan-Steiner S, Simeone R, Simon E, Bhatbagar J, Oduyebo T, Free R, et al; U.S. Zika Pregnancy Registry Collaboration; Zika Virus Response Epidemiology and Surveillance Task Force Pathology Team. Evaluation of placental and fetal tissue specimens for Zika virus infection — 50 States and District of Columbia, January–December, 2016. MMWR Morb Mortal Wkly Rep 2017;66:636–43. DOI: http://dx.doi.org/10.15585/mmwr.mm6624a3.

39. Shapiro-Mendoza CK, Rice ME, Galang RR, Fulton AC, VanMaldeghem K, Valencia Prado M, et al; Zika Pregnancy and Infant Registries Working Group. Pregnancy outcomes after maternal Zika virus infection during pregnancy – U.S. Territories, January 1, 2016-April 25, 2017. CDC Morbidity and Mortality Weekly Report. June 16, 2017;66(23):615-21. https://www.cdc.gov/mmwr/volumes/66/wr/mm6623e1.htm.

40. Peters SAE, Yang L, Guo Y, Chen Y, Bian Z, Du J, et al; on behalf of the China Kadoorie Biobank Collaboration Group. Breastfeeding and the risk of maternal cardiovascular disease: A prospective study of 300 000 Chinese women. J Am Heart Assoc.2017;6:e006081. DOI: 10.1161/JAHA.117.006081.

41. Caram-Deelder C, Kreuger AL, Evers D, de Vooght KMK, van de Kerkhof D, Visser O, Péquériaux NCV, Hudig F, Zwaginga JJ, van der Bom JG, Middelburg RA. Association of blood transfusion from female donors with and without a history of pregnancy with mortality among male and female transfusion recipients. JAMA. 2017 Oct 17;318(15):1471-8. doi: 10.1001/jama.2017.14825.