

HEALTH AND STRESS

The Newsletter of The American Institute of Stress

Number 7

July 2009

STRESS—IS IT WORSE FOR WOMEN OR MEN?

KEYWORDS: Involutional melancholia, PMS and murder, *actus reus*, *mens rea*, the "baby blues", postnatal psychosis, Andrea Yates, Melanie Stokes, hypothalamic-pituitary-adrenal axis, ADHD, mental retardation, mathematical and navigational abilities, language and communication skills, OWH Program, Saudi Arabia

According to a recent report from the U.S. Department of Health and Human Services' Office on Women's Health, women are twice as likely to suffer from major depression and three times more likely to attempt suicide compared to men. Women also experience anxiety disorders two to three times more often than men. The reasons for these gender disparities are not clear. Some believe the statistics are exaggerated because females are more "sensitive" and thus more apt to report such symptoms than males. However, hormonal differences are usually cited as the major explanation.

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The menopause is so frequently associated with depression, that there was formerly a distinct psychiatric diagnosis known as "involutional melancholia", the melancholy that accompanies "the change". There is also the common PMS (premenstrual syndrome) of increased irritability and mood swings prior to menses. This can cause such violent behaviors, that PMS has been successfully used as a defense for criminal acts ranging from shoplifting to murder.

Menopausal depression is usually attributed to lack of estrogen, and in one study, 80 percent of women with this complaint had dramatic improvement with estrogen supplements. On the other hand agitated and deranged behavior associated with premenstrual stress appears more likely to be due to low progesterone. One UK case involved a barmaid named Craddock, with a lengthy court record that included thirty prior sentences for theft, arson and assault, who was now charged with murdering a co-worker.

During the trial, years of diaries and institutional records were produced to document a monthly cyclical pattern to her past criminal and violent acts, many of which she had little recollection of. She was found guilty of manslaughter based on a plea of diminished responsibility due to PMS, which had "turned her into a raging animal each month and forced her to act out of character." Her final sentencing was delayed for three months to determine if her violent premenstrual behavior would respond to progesterone therapy. Because of her marked improvement, the judge ruled that PMS was a significant mitigating factor and she was placed on probation and ordered to take progesterone. Several months later, Craddock began a week of fasting, during which she did not take progesterone, and on the fourth day, she was arrested for throwing a brick through a window. She was again placed on probation and warned that this was conditional on her taking progesterone as prescribed. The following year, in 1981, she changed her surname to Smith, and her progesterone dose was reduced. After a few months, she attempted suicide, wrote a poison pen letter to a police sergeant, and was caught lying in wait for him with a knife behind the police station. Charged with carrying a deadly weapon, Smith's defense was the claim of "automatism". Criminal liability usually requires not only having committed the guilty act (*res actus*), **but also having a guilty mind (*mens rea*) or intent to commit a crime.** An automatism claim seeks to prove absence of guilt because the defendant acted like an automaton, a machine or robot, that makes automatic physical movements and cannot think, so there is no "guilty mind" component. The judge denied this plea since there was no evidence that Smith had acted in such an unconscious manner. However, because of her PMS, she was again placed on probation with the stipulation that she resume her original progesterone regimen.

Another murder case around the same time involved a woman named English, who, following a fight with her married lover, had rammed him into a lamppost with her car. Her lawyer claimed that she was not responsible for her actions because of severe PMS, but unlike Craddock, she had no prior criminal record or documented history of previous PMS problems. During the trial, it was revealed that she had not eaten for nine hours prior to the fatal incident. An expert witness testified that this had resulted in a low blood sugar, which, in turn, triggered a release of adrenaline and other hormones. This, combined with the stress of fighting with her lover, had severely aggravated her PMS symptoms. Several other physicians also testified that English had suffered from extreme PMS and there was no question concerning the stage of her cycle at the time of the "murder", since she began to menstruate the following day. The court ruled that she had acted under "wholly exceptional circumstances" and reduced the charge to manslaughter. She was set free after a jury found her to be not guilty of this on the grounds of "diminished responsibility due to PMS."

Postpartum Depression, Postnatal Stress Disorder And Placental CRH

Postpartum depression is also believed to be due to hormonal fluctuations. **Estrogen levels soar 50 times higher than normal during the last trimester of pregnancy and then plummet in the 48 hours after birth. Progesterone increases 10-fold and similarly falls 90-95 percent after delivery** and there may be significant changes in prolactin, oxytocin, thyroid and other hormones during the postpartum period. It is estimated that 8 out of 10 new mothers experience transient "baby blues" with symptoms such as sadness, mood swings and irritability that disappear spontaneously around two weeks after delivery. One in five new mothers suffers from more prolonged and severe depression characterized by crying, difficulty sleeping, decreased ability to care for herself or her baby, thoughts about death etc. that persist for months and do require treatment. Postpartum depression is accepted as a legal defense for criminal behavior in at least 29 countries, including Great Britain, Canada, Italy and Australia. However, it has only been recognized as a distinct mental disease in U.S. courts since 1994, and falls under the category of temporary insanity. What causes postpartum depression is not clear, although once it has occurred, it is likely to reappear with all subsequent births. It is more common in women with a past history of depression or a family history of depression, but these antecedents often do not come to light until postpartum depression is diagnosed and a more complete history is obtained.

Postpartum depression is frequently confused with postpartum or postnatal psychosis, which is sometimes referred to as "postnatal stress disorder", since patients are under severe emotional stress and exhibit unusual behaviors that are completely out of character. Postpartum psychosis is much rarer (1 in one thousand births) and also much more serious. Strange symptoms usually start to surface within three weeks after delivery, such as: feelings of being ordered by God or some higher power to do something harmful to oneself or the baby; seeing or hearing things that others do not; periodic feelings of intense confusion or agitation; fluctuating between extreme highs and lows of energy and mood, and other psychotic behaviors. One example is Andrea Yates, who methodically drowned her 5 children in a bathtub because she believed she was a "bad mother" due to the fact that Satan was inside her. At her 2002 trial, her attorneys claimed that she suffered from severe postpartum psychosis, and, in a delusional state, thought that killing her children would save them from going to hell, because they were still innocent. The jury was not convinced and she was found guilty of murder and sentenced to life imprisonment with no chance of parole. An Appeals Court overturned the conviction, and when retried in 2006, it was emphasized that she had tried to commit suicide on two prior occasions before the drowning and had been in a mental hospital a few months before. In a dramatic turnaround, she was found not guilty by

reason of insanity, and committed to a state mental hospital, where she will remain until she is no longer deemed to be a threat to herself or society.

Melanie Blocker Stokes, who started to develop strange symptoms two weeks after delivering a healthy and beautiful baby, is another illustration of postpartum psychosis. An attractive and successful upbeat pharmaceutical sales manager, happily married to a physician, there was no explanation for her sudden unwillingness to care for her baby and subsequent severe depression that made her stop eating and drinking. Despite a close and loving family that provided strong support and care, Melanie had to be hospitalized three times over a seven-week period. She received four combinations of anti-psychotic, anti-anxiety and antidepressant drugs as well as electroconvulsive shock therapy. However, although under almost constant observation, she committed suicide by jumping to her death from the twelfth floor of a hotel. Postpartum psychosis falls under the classification of Brief Psychotic Disorder, which, when diagnosed at an early stage, usually responds to treatment. The treatment of postpartum depression is less predictable and even in those with evidence of estrogen deficiency, replacement therapy improves symptoms in only ten percent. Most patients are placed on SSRI antidepressant drugs that boost serotonin levels. The main precursor for serotonin is tryptophan, and several studies have demonstrated low levels of tryptophan in postpartum depression. However, tryptophan supplementation that restores normal values also failed to result in any improvement. As noted in prior Newsletters, SSRI antidepressants are not significantly more effective than placebos in some clinical trials and can have significant adverse side effects. Postpartum depression is similar to a major depressive disorder in that risk factors include a prior history of depression or anxiety, recent exposure to stressful events, lack of social support and low self esteem.

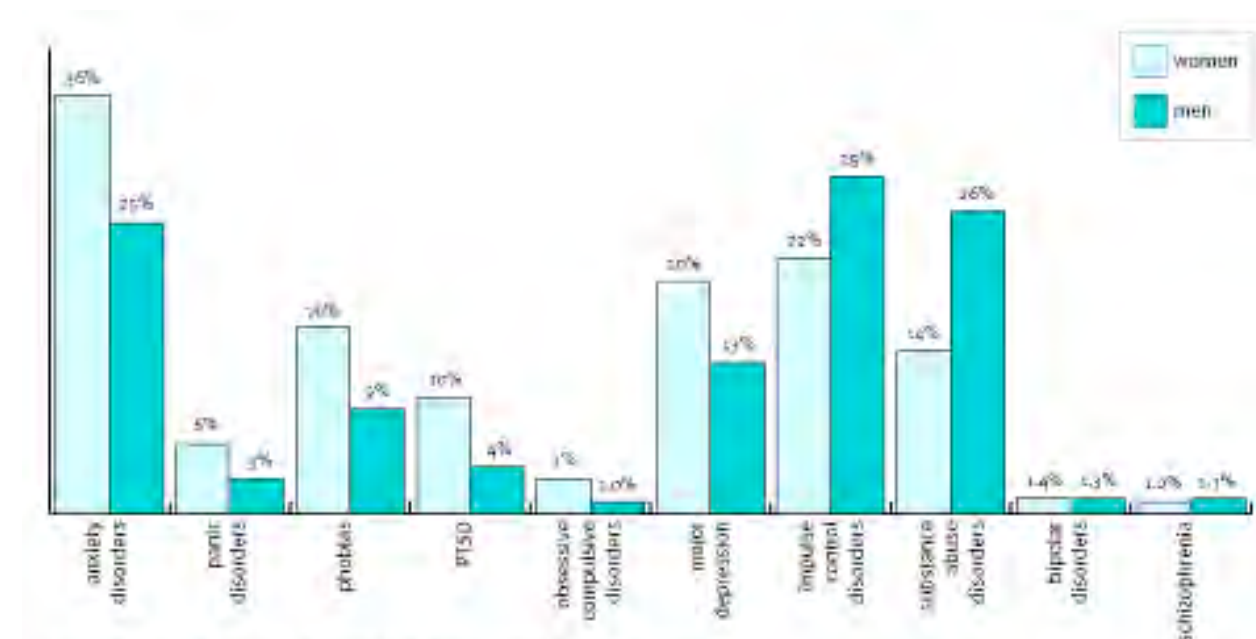
There are also endocrine risk factors such as a history of PMS or oral contraceptive-induced mood changes. Hormonal changes seen during activation of the hypothalamic-pituitary-adrenal (HPA) axis response to stress have long been associated with depression. These responses are activated by the release of corticotropin-releasing hormone (CRH) in the hypothalamus that then triggers pituitary production of ACTH, which stimulates the adrenal cortex to secrete cortisol. Many patients with severe depression have high levels of CRH, and a new study now suggests that an elevated CRH can accurately predict postpartum depression. **It is not generally appreciated that during pregnancy, the placenta also produces CRH, which is identical in structure and bioactivity to hypothalamic CRH.** The only difference is that while increased cortisol inhibits pituitary ACTH and hypothalamic CRH, it stimulates the production of CRH in the placenta. As a result, production of placental CRH steadily

increases during pregnancy and eventually reaches levels usually seen only during conditions of severe stress in nonpregnant controls. Researchers believe that the sudden disappearance of the placenta following delivery results in a sharp drop in CRH that can lead to postpartum depression by disrupting normal HPA axis regulation. Since this sudden change would be greatest in those with very high levels of CRH, it seemed likely that placental CRH measurements might be useful in predicting the likelihood of developing postpartum depression.

That theory is supported by this very recent study in which blood levels of placental CRH and other hormones were obtained from 100 pregnant women on five occasions between the 15th and 37 week of gestation. Ratings for depression were also periodically obtained during and after pregnancy. **A total of 16 women developed postpartum depression symptoms and in each case, placental CRH levels were found to be significantly elevated at the 25th to 27th week.** No such increase was found in ACTH or cortisol levels. **Researchers could accurately predict postpartum depression in three out of four women by blood tests alone, and did even better when test results were combined with measurements of depression during pregnancy.** Studies are underway in larger groups to confirm these findings. The ability to more accurately predict the likelihood of postpartum depression would allow physicians to implement prompt preventive and treatment measures that have been shown to be more effective when instituted as early as possible.

Why Women May Not Always Be The "Weaker" Sex

In addition to women having higher rates of depression and anxiety, the government's Office on Women's Health noted the following gender disparities for other mental health disorders.



As can be seen, women also have a higher incidence of phobias and obsessive-compulsive traits. On the other hand, **men are more apt to suffer from impulse control and substance abuse disorders**, with schizophrenia and bipolar disease showing little differences. There are obvious physical and physiological gender differences. The average mature male is stronger and taller than the average female and would likely be victorious in most physical contests. However, when it comes to superior health, surviving diseases and greater longevity, women appear to have the edge. While 115 males are conceived for every 100 females, things start to deteriorate after that. Male fetuses are at greater risk of miscarriage and stillbirth, and although male births slightly outnumber female births (about 105 to 100), premature male infants have a 22 percent death rate compared to only 15 percent for premature baby girls. Sudden infant death syndrome is one and a half times more common in boys, who are also much more likely to be autistic, dyslexic, develop ADHD or Tourette's syndrome, and to have higher rates of mental retardation than girls. Teenage boys die at twice the rate of girls the same age and males aged 15-19 are nearly twice as likely to die from a car accident, five times as likely to die in a homicide, and almost eleven times more likely to die due to drowning, than their "weaker sex" counterparts. Color blindness is 16 times more common in men and twice as many men eventually develop significant hearing loss compared to women the same age. Although women do attempt suicide more frequently, **four times as many men actually kill themselves, and men account for 84 percent of all suicides in senior citizens.**

Women have stronger immune systems and infection fighting T-cells, which may explain why men have higher death rates from pneumonia and flu. Women start to outnumber men around age 36 and by age 100, the ratio soars to eight to one. Men aged 55-64 are twice as likely as women to die in car accidents and those aged 55-74 are twice as likely to die of heart disease. Other leading causes of death like cancer and stroke also kill men at higher rates than women, so it is no surprise that the average life expectancy for men is six years less than for women. The only saving grace seems to be that males who do live to be 100 or older are in better physical and mental health than female centenarians, possibly because they have exercised more and are less likely to suffer from Alzheimer's disease.

Male brains are about 10 percent larger and have 6.5 percent more gray matter, which contains "thinking cells." However, that doesn't mean that men are smarter than women, since in this case, bigger is not necessarily better. Compared to men, women have almost 10 times as much of the white matter that connects various parts of the brain. They also use both sides of their brain more than men. Imaging studies that measure blood flow to areas of the brain when they are "working", show that when males

listen to someone reading a novel, only the left side of the brain is activated, whereas women show activity in both hemispheres. In addition, the frontal and temporal lobes and other language processing areas of the cerebral cortex are proportionally larger and more precisely organized in women, which may explain why they tend to have better language and communication skills than men. Brain sites involved in language and fine motor skills like handwriting mature about six years earlier in girls than boys and females are more apt to use language rather than physical activity to gain an advantage in arguments or competitive situations. It has been suggested that this enhanced ability to utilize language by manipulating information and "gossiping" provided survival value for females during the lengthy course of human evolution.

Studies show that women are also more adept and accurate in interpreting facial expressions and subtle changes in vocal intonations, which allows them to identify emotions and respond to them better than men. Women tend to pause more in conversations to allow others to speak and to facilitate interactions by providing supportive gestures. These language and communication skills also help to build and organize productive and mutually rewarding relationships. When confronted by a life-threatening situation both males and females react with "fight or flight" responses, but women are likely to also show "tend and befriend" behaviors that seek support from others. Boys respond to challenges with hyperactivity and an inability to control impulses whereas girls are more apt to exhibit a relative lack of attention. Boys are usually better at math and navigational skills, because the areas of the brain responsible for these activities mature earlier. One study found that the brain area involved in solving geometry problems in an 8-year-old boy resembled that seen in a 12-year-old girl.

Men also seem to be superior with respect to navigational skills and giving explicit directions, such as going east a certain distance, then north, etc. Women rely more on visual cues, like turning right at the church and then left just after the 7-11 store. Sophisticated imaging studies suggest the reason is that women use the cerebral cortex for navigating, whereas men rely on an entirely different more primitive area in the hippocampus that automatically codes where you are in space. It is not activated in females when they have navigational tasks, which may explain why men have a better sense of direction when there are no familiar landmarks. However these and other gender associated differences show considerable overlap and there are numerous exceptions. Some women show superior spatial and navigational skills, just as many men have exceptional dexterity with respect to fine manual motor activities, including superb handwriting. In addition, it seems likely that as more and more women become established in what

previously were primarily or even exclusively male occupations, some of these disparities will diminish or even disappear.

On average, girls begin puberty approximately two years before boys. The age at which menstruation starts is determined by genes that also influence body shape and development. Girls who get their periods earlier than age 12 are most likely to be short and pudgy and have a higher body mass index as adults. Those who don't start until after age 14 are more apt to be tall and thin and to begin menopause earlier than usual. As a result, they have a lower risk for cancer of the breast and uterus since they are exposed to lower levels of estrogen. Female fertility declines sharply by age 40 and ends with menopause, whereas men in their seventies can still father children. Evolutionary psychologists believe that gender differences are the result of reproductive strategies designed to insure survival. A male, who can increase his progeny by having many mates, is programmed to wander and to seek dominance. A female, for whom parenthood is time-consuming, saves her favors for males who are willing and able to "invest" in her and her young. A man looks for youth and attractiveness in a mate, which he views as signs of fertility; a woman looks for status and resources.

Things may be different today since both sexes have a choice when it comes to mating. One option is to take all your energy and focus it on competing to get as many mates as you can. The other is to have few mates and invest your reproductive energies on raising offspring. Men, who can have as many children as women they impregnate take the first option. Women, who are bound to their offspring by pregnancy and nursing, follow the latter. Even if these patterns are no longer relevant in contemporary society where many men now parent their children and women may be the primary breadwinners, evolutionary psychologists maintain they are "hard-wired" into our brains by millennia of evolution. From this perspective, emotional skills that might lead to a long-term or permanent relationship would have little value for men. In contrast, women would be apt to pursue men who are more likely to be there the morning after and help provide the food and protection mother and child will need to survive in a lasting relationship. This is consistent with outdated gender stereotypes that reduced the sexes to a species of aggressive philandering males and nurturing, monogamous females. And, as Albert Einstein noted, **"Women marry men hoping they will change. Men marry women hoping they will not. As a result, each is inevitably disappointed."**

Women Have Come A Long Way, But Will They Ever Achieve Equal Rights?

The nineteenth century novelist, George Sand, was noted for wearing men's clothes, smoking in public, and a Bohemian lifestyle that included affairs with Liszt, Chopin and other prominent individuals even though she was married.

Many believe this was her attempt to rebel against the way women were treated, which she described as follows: **"If they are ignorant, they are despised, if learned, mocked. In love they are reduced to the status of courtesans. As wives they are treated more as servants than as companions. Men do not love them: they make use of them, they exploit them, and expect, in that way, to make them subject to the law of fidelity."** That was over 150 years ago, and as a Bob Dylan song reminds us, "The Times They Are A-changin'", at least in the U.S.A. Today, there are few, if any occupations or sports women are excluded from, including driving 18-wheelers, operating huge cranes and other heavy equipment, wrestling, boxing, ice hockey, polo, competing in the Indianapolis 500 and Kentucky Derby, running for President or traveling to space stations and the moon. We now have same sex marriages, as well as households in which both parents are female.

Nevertheless, despite, equal rights and antidiscrimination legislation, many feel that women have still not attained parity with men, especially with respect to the workplace and certain aspects of health care. Despite superior experience, training and proven proficiency, women are still paid less than their male counterparts and are less likely to be promoted, especially when trying to reach the upper rungs of the corporate ladder. Men outnumber women by far in cardiovascular drug and device trials, and women complaining of chest pain are treated much less aggressively than men with similar symptoms. A recent study of patients with chest pain who were treated by paramedics before arriving at the hospital found that women were significantly less likely to receive standard care procedures such as aspirin to thin the blood, nitroglycerin to ease chest pain, heart rhythm monitoring, or IV lines to deliver medication. This is of particular concern since women have higher heart attack death rates than men. Consider also new generic drugs, which in order to be approved, must show blood levels within a 20 percent range of the prescription drug it is replacing. However, these blood tests are performed only in healthy young males, and it is not known if the results might be different in a postmenopausal female taking other medications that could significantly influence the findings.

The Office on Women's Health (OWH) was established in 1991 to "redress inequities in research, health care services, and education that have historically placed the health of women at risk." Its mission is to "provide leadership to promote health equity for women and girls through sex/gender-specific approaches." Recognizing that this will require the development of innovative educational programs for health professionals as well as consumers, it launched a comprehensive action program last Mother's Day to coincide with National Women's Health Week as described below.

Action Steps for Improving Women's Mental Health Program



At the center are a woman and a young girl holding hands inside an oval labeled Mental Health of Women and Girls. A ring around this oval is labeled Protective and Resilience Factors. An outer and thicker ring consists of three different colored segments labeled System-Based, Individual, and Environmental. Each of these three segments represents a set of two or three issues that can affect the mental health of women and girls

Going clockwise, the "Individual" segment contains two ovals: one labeled Biological and Developmental Factors and the other labeled Specific Mental Disorders. The "Environmental" segment contains two ovals: one labeled Trauma, Violence, and Abuse and the other labeled Social Stress Factors and Stigma. The "System-Based" segment contains three ovals: one labeled Health Systems Issues; one labeled Treatment, Access, and Insurance; and one labeled Identification and Intervention Issues.

Contrast this comprehensive approach with the situation in Taliban controlled parts of Afghanistan, the Belgian Congo and other locations where women have no rights and torture and rape are routine. Even in highly developed and wealthy countries such as Saudi Arabia, women are subject to numerous restrictions. This includes a strict dress code that requires completely covering the body, arms and legs, usually with a loose fitting, black floor-length garment called an *abaya*. The hair, head and face must also be covered with a veil and a woman must make every effort not to reveal her shape or face to avoid arousing lustful feelings in men. And if rape or a physical attack should occur, it will be deemed to be her fault for not adequately concealing everything. A man's permission is required to travel or to have surgery, women are not allowed to drive a car, go out in public without a male escort, or to be in a room alone with a man who is not their father, husband or brother. They are also discriminated against with respect to education, employment and especially the judicial system. Women

are not allowed to vote or even to testify in court unless it is about a private criminal matter that was not observed by a man. The reason for this is that their testimony is not regarded as fact, but rather presumption, because:

1. Women are much more emotional than men and will, as a result of their emotions, distort their testimony.
2. Women do not participate in public life, so they will be unable to understand what they observe.
3. Women are dominated completely by men, who by the grace of God are created superior; therefore, women will give testimony according to what the last man told them.
4. Women are forgetful, and their testimony cannot be considered reliable.

This makes women extremely vulnerable in cases of rape or physical assault, since only the attacker's testimony will be accepted as fact if no other male witnessed the event. If rape occurs, it is always the woman's fault.

These time-honored and traditional prejudicial practices are being challenged by a new generation of Saudis who grew up watching Arab TV reruns of *I Love Lucy* and *Oprah* that portrayed women in an entirely different light. During my recent visit, it was apparent that some of the restrictions on female visitors such as strict segregation and facial veils had been relaxed. And because of increased Internet exposure, teenage girls are now into Western music and thinking of careers beyond domesticity. King Abdullah has stimulated the establishment of mammoth medical complexes that will have a focus on training female physicians and scientists. (The chief pilot for the royal family's fleet of aircraft is a female, even though she has to be chauffeured to and from work.) He recently appointed Saudi Arabia's first female deputy minister, which is viewed as a major step towards allowing women to vote. During his June visit with King Abdullah and also at the University of Cairo, President Obama emphasized the need for change with respect to human (female) rights. The Koran gave women voting rights almost 1400 years ago (42:38) and states that men and women are equal in Allah's eyes (49:13). The two latest countries to allow women to vote are Kuwait and the United Arab Emirates, and other Muslim nations have already elected at least 10 female presidents. Saudi men manage women's affairs to protect them, but will this always include voting? — stay tuned to find out!

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Health and Stress The Newsletter of The American Institute of Stress 124 Park Avenue Yonkers, NY 10703 ANNUAL SUBSCRIPTION RATE: E-Mail.....\$25.00	ISSN#108-148X PAUL J. ROSCH, M.D., F.A.C.P. EDITOR-IN-CHIEF www.stress.org e-mail: stress124@optonline.net