

Aggression and Androgens in Women

Aggression leaves no species untouched, occurs across the sexes and has occurred throughout the ages. The word aggression is so widely used now that the real meaning has been lost somewhere over the years. So what is aggression? Aggression is,



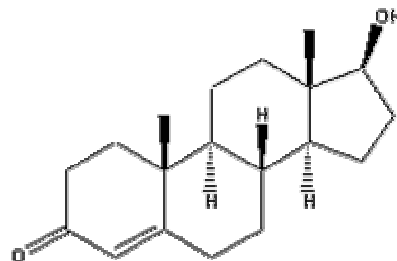
according to the Oxford English Dictionary, '(1) an unprovoked attack, the first attack in a quarrel; an assault, an inroad. (2) The practice of setting upon anyone; the making of an attack or assault.' Many studies have looked at aggression within males and the relationship between testosterone levels and male

aggression, but until relatively recently, no studies has looked at female aggression and the relationship between androgens and females. Does this mean that women are less aggressive?

Women tend to direct their aggression in different ways than men. Unprovoked aggression is quite uncommon in females whereas provoked aggression is usually when someone retaliates to a previous attack, sometimes rape. Women's aggression is more likely to be relational aggression. This is where a female pretends not to know someone or they become friends with someone to gain revenge on someone else or they exclude someone from their group or they try to disrupt other people's friendships. This can be observed from pre-school right through to adulthood. Young girls are constantly changing their best friends or 'falling out' with one of their classmates. This aggression seems to be part of a female's behaviour as nearly every female can honestly say that they have taken part or been the victim of this kind of aggression. But, there are some women who take part in physical aggression. Could this be down to raised levels of androgens within their bodies?

Androgens are basically masculizing hormones. For example, testosterone, 5alpha-dihydrotestosterone and cortisol, to name but a few. Androgens occur within the female body naturally, but there are about a tenth less than in the male body. Testosterone is produced in the body through some bodily processes, both in men and in women. Women produce testosterone in the adrenal gland but should only produce about one tenth of what a male produces. Testosterone has an androgenic effect on the body. Testosterone increases during the menstrual cycle and it is at this point that the androgens are at the highest level within the female body. Around 70% of women claim to have committed their crimes while experiencing PMS. I, like others, feel that this may only be a claim as to give an excuse for what they have done. Most people know that PMS is related to irritability, but it is also linked with aggression and hostility. Is this because testosterone is at greater levels within the body during this time of the month? Or does this just free women up to become deviates? Some investigation into this area have shown that injections of testosterone into female animals, cause more masculine behaviour, which includes an increase in aggressive behaviour. Berenbam and Synder (1995) supported this further by showing that girls with adrenal gland tumours (these result in increased testosterone levels) show boyish behaviours. These behaviours include rough play and toy fighting.

Pahlen, Lindman, Sarkola and Eriksson (2002) found that testosterone (figure of testosterone shown here) and 5alpha-dihydrotestosterone might affect the basal regulation of aggression in women. Testosterone and 5alpha-dihydrotestosterone use different pathways within the body and can therefore affect aggression in different ways. They came to this conclusion by enlisting healthy, premenopausal women to take part in an experiment.



These women carried out the Buss-Perry aggression questionnaire (see appendix 1). Blood samples were taken in the middle of their menstrual cycles to analyse the plasma androgen levels. Five androgens were investigated: testosterone (free and total), 5alpha-dihydrotestosterone, androstenedione and dehydroepiandrosterone. They wanted to find out which of these androgens might best predict aggression, analysing the questionnaires helped this. Another study, which supports these findings, is that of Ehlers, Richler and Hovey (1980). They gathered 28 female outpatients as participants, who were then split into two groups: aggressive violent group (14) and non-violent group (14). These women were not pregnant or menopausal, had normal menstrual cycles, they had not had a hysterectomy and were not taking an oral contraceptive. However some of the females in the aggressive violent group did show some psychiatric symptoms. The conditions were near perfect. One blood sample was taken in the morning, which tested for testosterone, prolactin and cortisol levels. The results showed that testosterone was significantly higher in the violent group than in the non-violent group. They concluded that testosterone might have a positive relationship with aggression in women.

Prison studies have been helpful in studying aggression and androgens in women, due to the fact that there is a plentiful supply of aggressive or violent women.



Dabbs, Ruback, Frady, Hopper and Sgoutas (1988) compared the relationship between salivary testosterone in eighty-four female prisoners (ages 17-66) and fifteen students (ages 18-26). Prisoners provided two saliva samples (in the afternoon), one in one month and one in the next month. The students provided a saliva sample in the morning (Testosterone is at its highest level, in the body, in the morning and at it's lowest in the afternoon)

. The female prisoners were divided into three groups depending on the crimes committed. The first group consisted of five female prisoners who had attacked someone who was violent towards them; these were classed as defensive aggressors. The second group consisted of fifteen female prisoners who had been violent towards someone for no apparent reason and the remainder of female prisoners had played a part in drugs, theft or other minor crimes. The defensive aggressive group had lower testosterone levels than the provoked group, but there were no significant differences between the defensive group and the students. Overall this may show that some women have higher testosterone levels than other women and therefore male them more likely to have an aggressive nature, testosterone can be both a cause and effect of aggression, which may explain why the testosterone levels differ between the prisoners. Also, in this study (unlike the one before) the conditions were not as controlled. There has been shown to be a positive correlation between violence in female prisoners and, levels of androgens within their bodies, but it is not yet clear if androgens facilitate aggression or if they encourage social dominance, competitiveness and impulsiveness. The down side to studying criminals (of any sex) is that they are an extreme group of individuals. This is to say that, their lifestyles are completely regulated; they are not a norm of the population. They live within a restricted stressful environment, which may increase testosterone levels within the body anyway. Dabbs et al (1998) stated that violent female criminals have elevated testosterone levels at the best of times.

Some studies have examined the effect of facial expressions on the increase of



Testosterone within the body. Honk et al (2001) carried out a study on fifteen young healthy women. They administered a small dose of testosterone (0.5mg) to the women and showed them pictures of

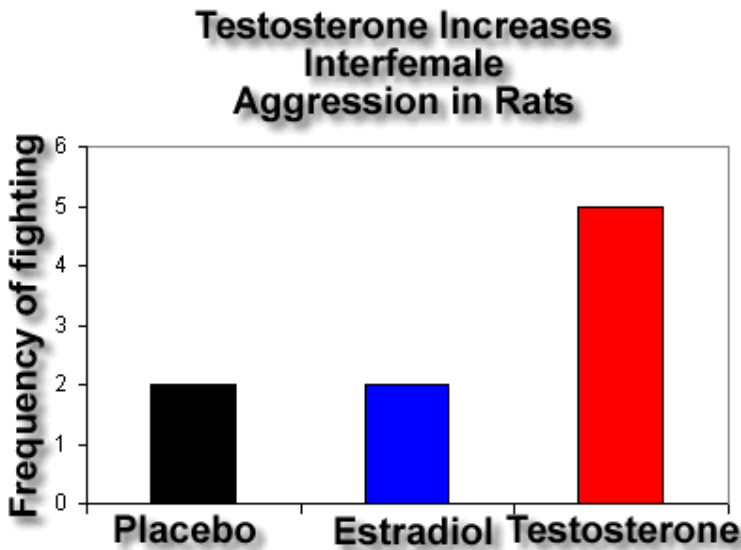


Various facial expressions; the facial expressions were neutral, happy or angry. The dose of testosterone showed an increase in cardiac responses to angry faces. Each participant was given a questionnaire to complete throughout the study; this was used to record their mood changes. The results concluded that exogenous testosterone increases the cardiac acceleration responses to angry faces in young women.



Other studies that have been useful in investigating androgens in females are that of animal studies. It has been found that if neonatal female rats are exposed to high levels of androgens, they are born as a masculinised female rat. These rats show more boyish behaviours than feminised female rats. Mice are linked up like peas in a pod pre-natally. If female mice are either next to or opposite male mice then their blood plasma levels tend to contain more androgens than female mice beside other female mice (R1, R2, R3 etc, the number represents the number of males close to the females inside the womb). It has been shown that compared to females beside females, females beside males show an increase in masculine behaviour post-natally. This involves greater levels of aggression. This concept may also be the case in male-female twins, triplets etc. Bearing that in mind, this may also work the other way around causing the males to become more masculinised. Van de Poll et al (1988) found that testosterone, not oestrogen, increased aggressiveness in female rats. The following graph shows how significant the results of Van de Poll et al's experiments are. The graph shows that compared to the placebo, oestrogen did cause a significant

difference in the frequency of fighting in female rats. Whereas, the presence of testosterone shows a far greater frequency in fighting. Animals are a good source of experimentation as there are very few ethical issues to consider, when compared with a human study.



I have discussed many studies throughout, but have not yet come to a solid conclusion. Yes, it seems that androgens can have an effect on aggression in females, but on the other hand there is no solid evidence to say that a definite increase in testosterone causes aggression. Going back to the point I made earlier, testosterone can be both a cause and effect of aggression, which means that testosterone can cause aggression but can also be a product of aggression. There are two main types of aggression, direct and indirect aggression. Direct aggression is when the anger is aimed at a significant other, like a spouse sibling parent. This often occurs as retaliation to a previous attack and, as stated before in the prison studies, does not necessarily mean that there is an increase in testosterone. Indirect aggression is anger, which is not aimed at anyone in particular, lashing out for no apparent reason. This type of aggression usually means that there are greater levels of testosterone within the body at the time of the attack.

Maybe there are not as many studies on women, aggression and androgens because women, in general, commit fewer crimes than men (Campbell et al, 2001). Testosterone not only can cause aggression, but it also causes a need for social status, women do not need this social status as much as men. Most women show a greater fear of physical harm than men and do not like putting themselves in harms way, so does this mean that women with increased testosterone levels are more like men than women? There are many questions in my mind that are left unanswered about this topic. But what I have got out of this is that there seems to be some evidence, which suggests that an increase in androgen levels within a woman's body causes more aggressive behaviour, but a lot of investigation still has to be done to support this theory.