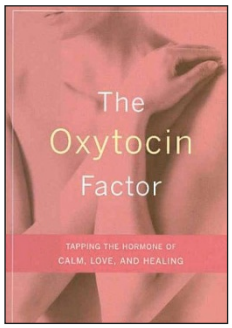
Unleashing the 'love' hormone



The Oxytocin Factor

By Kerstin Uvnäs Moberg

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Reviewed by Cort A Pedersen

This is not an impartial review. Having long been a convert to the view that the neuropeptide oxytocin is of great importance in social and reproductive behavior and emotions, I am sympathetic to Uvnäs Moberg's message. My bias acknowledged, I find her book to be an excellent introduction for the general public.

Oxytocin has often been written about in the popular press, especially as a 'love' hormone. This is the first book to summarize the full spectrum of oxytocin's effects, and to integrate them into a comprehensive picture of brain-body relationships. It is fitting that Uvnäs Moberg has authored this book, because her research group has been the most prolific and perhaps the most innovative in examining the psychophysiological roles of oxytocin in people and animals. In *The Oxytocin Factor*, she expands on her influential hypotheses that this neuropeptide mediates many of the health benefits of social support and may be an important 'antistress' factor. The book emphasizes the many potential therapeutic applications of oxytocin or oxytocin-like drugs. This, hopefully, will spark greater interest in testing oxytocin as a treatment for a number of disorders, and in developing central nervous system–penetrating oxytocin agonists suitable for clinical trials.

One would think that the pharmaceutical industry would be interested in investigating oxytocinergic compounds. In addition to stimulating female and male sexual behavior, penile erections and social closeness—including parental and monogamous bonding—oxytocin diminishes pain, depression, anxiety, aggression and stress hormone release, lowers blood pressure, counteracts addiction and drug withdrawal, modulates appetite and digestive processes and promotes wound healing. Few, if any, other neurochemicals have such a broad spectrum of beneficial effects.

Moberg places oxytocin at the core of a hypothesized 'calm-and-connection' system that promotes the vital functions of relaxation, recuperation, growth and friendly social interactions. She views this system as actively suppressing the classical fight-or-flight reaction to stress. The author explains how the projection patterns of anterior hypothalamic oxytocin neurons make them particularly well suited for transducing environmental and internal homeostatic stimuli into coordinated endocrine, autonomic, emotional and behavioral responses.

In her description of the hypothesized calm-and-connection system, Uvnäs Moberg manages to include all of the potential therapeutic effects of oxytocin. She notes that oxytocin is released by some antidepressant and atypical antipsychotic drugs, and cites animal studies showing that oxytocin has effects similar to these medications. The author draws from her extensive research to make the case that oxytocin mediates the beneficial effects of alternative therapies such as massage and acupuncture. Uvnäs Moberg acknowledges that rapid enzymatic degradation and limited blood-brain barrier penetration are major obstacles to therapeutic application of oxytocin. But she then correctly points to many published reports that peripherally administered oxytocin exerts emotional, behavioral and psychophysiological effects in animals and humans.

This book has a number of limitations. The 'personal quest' perspective taken by the author leaves many important contributors to this story unmentioned. The fascinating evolutionary context of oxytocin is barely mentioned. Oxytocin (and the structurally similar neuropeptide vasopressin) is unique to mammals but evolved from peptides composed of nine amino acids—nonapeptides—found in all lower vertebrates and some invertebrates. These phylogenetically older nonapeptides have been implicated in various reproductive functions and behaviors in fish, amphibians, reptiles and birds, including spawning, courtship, copulation and egg-laying. Although occurring only in mammals, oxytocin-stimulated labor, milk ejection and maternal behavior can be viewed as the most recently evolved nonapeptide-mediated reproductive strategies. The stress- and anxiety-suppressing effects of oxytocin may reflect a broader role of nonapeptides, during vertebrate evolution, in the emotional control necessary for successful reproduction and related social interactions.

Uvnäs Moberg's message could have been enriched by splicing in recent observations suggesting that oxytocin may be important in mediating the effects of some early life experiences. The amount of maternal licking rats receive during infancy determines their adult levels of stress-induced anxiety and adrenal axis activation and, in females, how much they subsequently lick their own pups. Maternal licking seems to exert these effects in female offspring partly by influencing oxytocin receptor expression in brain areas that regulate stress responses and mothering behavior. Pharmacological experiments also indicate that oxytocin activity in the brains of infant mammals may influence the development of neurochemical systems that regulate adult social behavior.

Other minor criticisms could be directed toward *The Oxytocin Factor*. Significant species differences in the role of oxytocin are not mentioned. Oxytocin stimulates sexual behavior in female rats, for example, but suppresses sex in female prairie voles and sheep. In addition, the effects of vasopressin are not always opposite to those of oxytocin. It may be unreasonable, however, to expect the author to digress into such complexities in a brief work for a general audience.

In sum, Uvnäs Moberg has written the sort of book that serves the public well. This is an entertaining, succinct, largely accurate telling of a biological tale that may prove relevant to understanding our most important experiences—in this case, the love and affection we feel for others and their essential role in our health and enjoyment of life.

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