THE PSYCHOSOCIAL DERMAL AXIS

It's time for psychiatry, dermatology, and aesthetic medicine to unite and explore.

BY STEVEN H. DAYAN, MD, FACS

The emotional organ has me excited, but it may not be the one you are thinking of. The psychosocial dermal axis, a neurologically embodied highway that shuttles information between the skin and the brain, is creating a buzz. The skin is our body's first line of defense and is intricately linked to the command-and-control centers in the brain in an evolutionarily preserved system developed from the same embryological ectodermal layer. This symbiotic alliance is consistent throughout the animal kingdom and forges a unique partnership to recognize, respond, and adapt to the realities of a harsh environment. In a virtual world, with an increasing social incompetency, an efficient subconsciously active intrapersonal and perhaps even interpersonal communication system is valued.

Most conversations about the psychosocial dermal axis default to the psychiatry co-morbidities recognized in those with skin disorders. Skin has a well-known co-dependency with mental health. Flushing is commonly associated with anxiety as well as depression with acne. A study in the *British Journal of Dermatology* reports 25% of outpatients seen in a dermatology clinic have a psychiatric comorbidity.[1] But a new way of thinking has attention focusing on the external communicative influences of the skin.

Almost everyone can relate to the physical changes that occur when the uneasy feeling of a looming danger is present. Before we even recognize a threat, body hair stands erect, skin nerve endings sensitize, and piloseba-

LEARNING OBJECTIVES

- Evaluate a new way of thinking that has attention focusing on external communicative influences of the skin.
- Analyze if humans might communicate subconsciously to perceive beauty and threats using a sense that is yet-to-be described.
- Identify the similarities between the brain and the parallel evolved skin.

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Similarly, even our phylogenetically lower predecessors from reptiles to deer have an attuned alarm system that is quick to warn of a nearby threat. They know it's time to evade. What is exactly being sensed and by what sensory system? Many refer to it as energy; others jokingly mention a sixth sense. A few years back, I became enthralled by an article on how the visually blind could detect danger via subconscious midbrain pathways.[2] The ability to sense a threat effectively is an important mechanism for survival and genetic preservation. Similarly, beauty, nature's way of communicating health, wellness, and good gene status, has an evolutionary strategic value.

SENSING BEAUTY

Therefore, it is not surprising that sensing beauty is also processed in the same archaic parts of the brain. Based on this thinking, in 2019, we designed and published results from a clinical trial evaluating the ability for the visually blind to detect beauty.[3] It was just the beginning of a realization that humans may communicate subconsciously using a sense other than visual, auditory, olfactory, or tactile. Perhaps we perceive beauty and threats via a yet-to-be described sensory pathway?

When the COVID-19 pandemic hit, we were locked into a virtual world. Communication—whether professional, romantic, or familial—was forced through an insentient portal. While we managed through, most knew something was missing. Humans require social interaction to thrive, and the physiological plus psychosocial values of in-person human interaction have become increasingly recognized. This prompted the question: Could there be subconscious communicating signals when standing adjacent to another person that are perceived through the skin?

A deeper dive into the literature reveals that the parallel evolved skin and brain have important similarities. The skin has more than 5 million nerve endings, and found within the skin are many of the same neurotransmitters common to the hypothalamic pituitary axis. Feel-good neuropeptides, such as serotonin, dopamine, beta endorphin, and oxytocin,[4] are all synthesized and active in the skin. Fluctuating skin levels effectuate release or inhibition of similar peptides centrally, which then can influence emotions and perhaps behaviors. Nowhere is this more understandable than the cutaneous serotoninergic system transforming light of solar radiation into a biological beta endorphin release.[4] Every sunbather knows the mood elevation felt by the sun.

THE LOVE HORMONE

One neuropeptide of particular interest is oxytocin, first discovered in 1953. It has profound systemic as well as cutaneous anti-inflammatory, anti-apoptotic, and antioxidant effects.[5,6] It suppresses skin senesces, promotes insulin uptake, and facilitates wound healing.[5-7] However, oxytocin, affectionately called the "love hormone," is best celebrated for its pro-social benefits. The mood-elevating, relationship-enhancing neuropeptide plays an integral role in mating, pregnancy, and parenthood. Its benefits are storied and continue to be serendipitously elucidated. Many recount a euphoria felt during pregnancy as well as during breast feeding, and those who enjoy massages boast of the serenity following human touch. Gentle touch working through the dermal PIEZO1 mechano-receptors results in increased local oxytocin levels, which then, via a unique posi-

QUESTION

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AT A GLANCE

- The skin has more than 5 million nerve endings and found within the skin are many of the same neurotransmitters common to the hypothalamic pituitary axis.
- Feel-good neuropeptides, such as serotonin, dopamine, beta endorphin, and oxytocin, are all synthesized and active in the skin.
- Results of a 2024 study found skin- and mood-enhancing benefits from a unique combination of ingredients anchored by an oxytocin-inducing topical agent.

tive neuro-feedback loop, upregulates oxytocin releases centrally.[8-9] Systemically, elevated oxytocin leads to pupil dilation, an ability to better read the emotional intent of others, and increased trust and attraction for one another.[10-13] Men with surged oxytocin levels exhibit greater fidelity to their monogamous partners.[14] For both men and women, sexual performance, orgasm intensity, and sexual satisfaction are elevated when oxytocin is bountiful.[15] We get drunk off oxytocin—and, again, much of this is started secondary to a gentle touch.

In 2024, to further challenge the skin as a second brain theory, we conducted a double-blind randomized placebo-controlled trial evaluating the skin- and mood-enhancing benefits of a unique combination of ingredients anchored by an oxytocin-inducing topical agent. The findings were profoundly and statistically significant. Beyond the expected skin-quality improvements—characterized by increased radiance, dewiness, and skin tone evenness along with reduced redness—it was the psychosocial benefits that were surprising. Subjects who used the active product for 8 weeks made a better first impression, were found to be more attractive, and appeared 3 years younger. They changed their perception in 8 weeks finding masculinized men more attractive. The most surprising result was the profound and overwhelming improvement in sexual satisfaction in 18 of 20 categories evaluated using the validated New Sexual Satisfaction Scale (NSSS). In contrast, the placebo group improved in 0 of 20 categories.

CONNECTION IN A VIRTUAL WORLD

The findings were noteworthy and inspiring. Is it time for psychiatry, dermatology, and aesthetic medicine to unite and explore if, or how, we communicate when in proximity? There may be no greater motivator to start evaluating the psychosocial dermal axis than the rapidly evolving world of artificial intelligence and robotics. AI will soon out-compute us, but it will never out-feel us. Our minds, moods, and socialization are greatly influenced by and through the skin. Neuro-communicative abilities, both internally and externally, will become increasingly important to the thriving human species in the virtual years. Our skin-brain axis may be the last bastion of authenticity in human-to-human connection. ■

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