

Review

Intimate Contact Could Be Dangerous for Your Health



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ABSTRACT

Purpose: To review evidence of hypersensitivity reactions to allergens and/or pathogens transmitted via intimate contact.

Methods: We reviewed PubMed for publications in English between 1980 and 2018 using the terms *allergy, drugs, foods, hypersensitivity, intercourse, kissing, Kounis syndrome, mast cells, and semen.*

Findings: In human RELATIONSHIPS, intimate contact can occasionally have disastrous or even fatal consequences because antigens and pathogens can be transmitted via the oral and vaginal mucosa. Hypersensitivity to semen is an underrecognized problem. Some individuals also developed acute coronary hypersensitivity, which mimics myocardial infarction, known as Kounis syndrome.

Implications: Hypersensitivity reactions to allergens and/or pathogens via intimate contact are common and should be recognized. Sensitive patients should be evaluated for atopic diathesis because such patients may be more susceptible and could also develop Kounis syndrome. (*Clin Ther.* 2019;41:1222–1226)
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Keywords: allergy, intercourse, kissing, Kounis syndrome, mast cells, semen.

INTRODUCTION

Severe hypersensitivity reactions to allergens and/or pathogens via intimate contact are an increasing problem but have not been adequately addressed. In addition, the atopic state of an individual can affect sexual behavior.

We reviewed PubMed for publications in English between 1980 and 2018 using the terms *allergy, drugs, foods, hypersensitivity, intercourse, kissing, Kounis syndrome, mast cells, and semen.* This discussion is limited to substances ingested or present in the body (biological fluids) and does not include products that may be applied to the genital or other areas. Moreover, potential allergens excreted in the skin in general are also not included.

Kissing is an ancient ritual for expressing affection or erotic desire. *Kiss of death* is an expression that indicates that an act or relationship has serious consequences. The word *kiss* is often used in the medical literature to denote cell-to-cell interactions, as in the *golden kiss* of death to mitochondria for efficient cancer cell killing and

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activation of caspases leading to apoptosis.¹ Delivering the *kiss of death* has been used to describe how perforin and granzymes are secreted from cytotoxic T lymphocytes² and natural killer cells,^{3–5} especially with respect to killing cancer cells.^{6,7} Membrane *kissing* describes a stable intermediate fusion step that mediates hormone secretion.⁸

In human relationships, passionate kisses can occasionally have disastrous or even fatal consequences. A passionate kiss on the lips, labia, or penis could lead to unexpected adverse results because antigens and pathogens can be transmitted via the oral, vaginal, or prostatic contents.

HYPERSENSITIVITY REACTIONS CAUSED BY KISSING

Allergic reactions to food allergens via kissing seem to be relatively common^{9,10} and have been reported to result in fatal or nearly fatal anaphylactic reactions.¹¹ In a survey of 379 people with self-reported histories compatible with IgE-mediated food allergy, 20 (5.3%) reported reactions from kissing.⁹

In a questionnaire of 1139 patients (1–84 years old; mean age, 29 years; 393 males and 746 females) who considered themselves to be allergic to foods, 12% of the patients experienced allergic symptoms when kissed by a person who had eaten a food to which they were intolerant.¹² The close contact of 2 oral mucosae during kissing can lead to an oral allergy syndrome if one person is sensitized to the food just eaten by the other, such as kiss-induced allergy to peanut,¹³ oral allergy syndrome to apple after kissing,¹⁴ severe allergic reactions to a shellfish induced by a kiss,¹⁵ and oral allergy syndrome from kiwi fruit (*actinidia chinensis*) after a kiss.^{16,17}

In a survey of people who experienced allergic reactions to peanuts served on commercial airlines, 48% had eaten the peanuts, 33% had inhaled peanut allergen, and 19% had skin contact.¹⁸ Peanut allergy via saliva is also common,^{13,19} with infants with eczema²⁰ especially susceptible to peanut allergy transmitted through high-saliva kisses. The amount of allergens present in saliva seems to play an important role in the severity of reactions via this mode of exposure, as has been reported for peanut allergy transmission.¹⁹

In a study of 38 individuals¹⁹ designed to determine the concentration of Ara h 1 as a marker for peanut protein in saliva, the quantity of peanut in saliva, and the duration of

allergen persistence in saliva after ingestion of a peanut butter sandwich, it was found that (1) salivary Ara h 1 levels as high as 40 mg/mL are expected to invoke reactions; (2) approximately 5 mL of saliva is transferred during kissing and 15% of peanut protein is Ara h 1; (3) 1 mL of saliva would equal a transfer of 8 mg of peanut protein during kissing; (4) Ara h 1 remains detectable in approximately 40% of samples; and (5) teeth brushing, mouth rinsing, and chewing gum significantly reduce Ara h 1 levels in saliva.¹³

Facial urticaria and angioedema were elicited in a 2-year-old girl allergic to fish when kissed on the cheek by her grandfather, who had eaten fish 2 hours earlier.²¹ Drug allergy transmitted by kissing has also been reported.²² One case described a 45-year-old woman sensitized to bacampicillin when her husband kissed her while he was taking this drug for the treatment of gingivitis.²² Pet kissing, licking, and dander are pathways of microbe and allergen transfer that could affect humans. Most public indoor areas and 90% of all homes may have small, suspended, particulate animal allergens, and skin prick testing data indicate that pet allergy may be the most common perennial allergen in the United States.²³ The most important cat and dog allergens are Fel d 1 and Can f 1, respectively. Homes with pets have significantly more Fel d 1 or Can f 1 allergens than homes without pets, whereas automobile seats have levels of dog and cat allergen that are well above the threshold levels for human sensitization and symptoms.²⁴

Apart from allergens, skin, oral mucosa, and saliva can transmit microbe and viral pathogens. A striking example is the *kiss of death* of a 23-year-old South African man who developed fulminant hepatic failure and died of multiorgan failure because of overwhelming sepsis after kissing a woman with oral active herpes simplex virus infection.²⁵ Postcoital reactions can also occur in drug sensitive patients.^{26–29}

ACUTE CORONARY SYNDROME

Kounis syndrome is an allergy-associated acute coronary syndrome.³⁰ One such case concerned a 23-year-old man with a previous history of oral allergy syndrome to kiwi fruit, who developed acute myocardial infarction after ingesting a piece of kiwi fruit, presumably resulting from coronary artery constrict caused by coronary hypersensitivity.³¹ This was the second report of kiwi fruit–induced Kounis syndrome since the first report in 2010.³²

In one report, 17 patients developed Kounis syndrome confirmed by cardiac catheterization and positive skin test results to β -lactam antibiotic with elevated serum IgE, histamine, and tryptase levels.³³ In another study, a patient with atopy sensitized to β -lactam antibiotics, with a previous history of 2 myocardial infarctions after amoxicillin oral intake, developed for a third time an acute myocardial infarction characteristic of Kounis syndrome after he was licked on the face by his dog, who had been treated with amoxicillin.³⁴

ALLERGIC REACTIONS TO SEMEN AND SEXUAL BEHAVIOR

Hypersensitivity to semen is an increasingly reported problem³⁵ and may serve as an extreme form of evolutionary adaptation.³⁶ There have been numerous reports of individuals experiencing both localized (chest, vagina)^{37–40} and systemic^{38,41–43} reactions to human semen, including anaphylaxis.^{44,45} Sometimes, these reactions have been termed *postorgasmic illness syndrome*.^{46,47} One interesting case involved an allergic reaction to Brazil nuts in a woman who had intercourse with a boyfriend whose semen was positive for Brazil nut antigen after he consumed them.⁴⁸

Dogs can also be triggers for allergy to semen.^{49,50} In particular, prostatic kallikrein has been identified as a major dog allergen and found to be identical to a protein in dog dander with cross-reactivity with human seminal fluid,⁵¹ which cross-reacted with human prostate specific antigen, thus explaining IgE-mediated vaginal reaction to semen.⁵² A similar type of cross-reactivity was reported between rubber latex and human seminal fluid.⁵³

DISCUSSION

Allergies, including asthma⁵⁴ and atopic dermatitis,^{9,55} can adversely affect sexual behavior.^{38,56} Patients with rhinitis⁵⁷ and rhinosinusitis^{47,54,58–61} experience sexual dysfunction, implicating allergies in the sexual response. Mast cells are unique immune cells responsible for hypersensitivity reactions⁶² through secretion of many mediators that may have both proinflammatory and anti-inflammatory effects.^{63,64} Mast cells may affect sexual function, depending on the mediators secreted, especially because mast cells respond to neurohormonal triggers.⁶⁵ Mast cells are found in the genitourinary organs⁶⁶ and in seminal plasma of infertile men,⁶⁰ but the function of mast

cells in these instances remains vague. A recent article reported that newborn male rats had a greater number of stimulated mast cells in the preoptic area, a brain region important for copulatory behavior, whereas the absence of mast cells in newborn male rats promoted a female phenotype; conversely stimulation of mast cells in newborn female rats promoted a male phenotype.⁶⁷

CONCLUSION

Severe hypersensitivity reactions to allergens and/or pathogens via intimate contact are an increasing problem that should be recognized. Avoiding potential allergens and desensitization to known drug or environment antigens⁶⁸ should be contemplated for those with severe allergies. Moreover, sensitive patients should be evaluated for atopic diathesis,⁶⁹ especially the presence of conditions such as mast cell activation syndrome⁷⁰ or multiple chemical sensitivity syndrome,⁷¹ because such patients may be susceptible to developing Kounis syndrome.

CONFLICTS OF INTEREST

The authors have indicated that they have no conflicts of interest regarding the content of this article.

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