Oral administration of gluten induces anaphylactic reaction in mice sensitized percutaneously by various kinds of hydrolyzed wheat protein

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Hydrolyzed wheat protein (HWP) is obtained by hydrolyzing gluten, a typical allergen of wheat, which is widely used as an additive in cosmetics and food products. Recently, HWP is reported to induce IgE-mediated hypersensitivity by percutaneous sensitization and/or food ingestion of wheat protein, although it has not yet been examined if wheat or HWP can induce allergic responses after the percutaneous sensitization. In this study, we investigated whether allergic reaction was induced by repeated oral administration of gluten to mice sensitized with various kinds of HWPs. Mice were sensitized by percutaneous exposure to HWPs in the back skin for 4 weeks, and then mice were challenged orally with gluten 9 times for 3 weeks with or without aspirin for accelerating gluten absorption. A decrease in rectal temperature or anaphylactic death was not observed in the group challenged orally with gluten. In contrast, mice given oral administration of gluten with aspirin showed a significant decrease in rectal temperature leading to some cases of anaphylactic shock. These findings demonstrate that percutaneous sensitization with some HWPs and oral challenge with gluten and aspirin can induce anaphylactic responses, and indicate that some HWPs have high antigenicity by acidification and hydrolysis with heat during the manufacturing process.