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Adverse Reactions of Food in Pediatrics

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ABSTRACT

Background: An adverse food reaction consists of any abnormal reaction to the ingestion of food or additives, and it can be either toxic or nontoxic Adverse reactions to food (AFR) in children are a source of increasing concern worldwide A toxic reaction results from the pharmacologic actions of a substance within a food. These reactions can occur in anyone who is exposed to the food and do not depend on host factors. These substances may be enzymes or any agent that could cause reactions in the body. Examples of toxic reactions include nausea from bacterial food poisoning, heavy metal poisoning, and itching and flushing from histamine ingestion as seen in scombroid fish poisoning **Aim of the work**. Is to review the classification of food adverse reaction in pediatrics and the prevalence, pathogenesis, clinical manifestation, diagnosis and management of each type as they are a source of increasing concern worldwide. **from this study we can confirm that** Adverse reactions of food are classified into toxic and non-toxic reactions. Non-toxic reactions are either immune mediated or non-immune mediated. Food allergy is an immunological reaction to food with increasing prevalence due to multiple risk factors. It is either IgE mediated, cell mediated or mixed IgE and cell mediated. It occurs when the risky child exposes to some allergens and could be presented by anaphylaxis, skin, respiratory, CVS, GIT manifestations. Avoidance of the allergenic food is the main line of treatment. Food intolerance is a physiologic response to food. It includes metabolic disorders, idiosyncratic response and psychological disorders. It represents the majority of adverse reactions of food.

Keywords; Adverce reaction , food poising , toxic reaction in pediatriac

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List of Abbreviations

AA	**:**	Arachidonic acid.
AAF	**:**	Amino acid formula.
AAI	**:**	Adrenaline auto-injectors.
AD	**:**	Atopic dermatitis.
AGA	**:**	Antigliadin antibodies.
APT	**:**	Atopy patch test.
ATI	**:**	Amylase trypsin inhibitors.
BH4	**:**	Tetrahydropterin.
BP	**:**	Blood pressure.
CC	**:**	Coeliac crisis.
CD	**:**	Coeliac disease.
CMA	**:**	Cow's milk allergy.
CMPA	**:**	Cow's milk protein allergy.
CRD	**:**	Component-resolved diagnosis.
DAO	**:**	Di-amine oxidase.
DBPCFCs	**:**	Double-blind, placebo-controlled food challenges.
DGP	**:**	Deamidated forms of gliadin peptides.
DHH	**:**	Docosahexaenoic-acid.
EA	**:**	Egg allergy.
EAI	**:**	Epinephrine auto-injectors.
EHF	**:**	Extensively hydrolyzed formulas.

EIA : Exercise-induced anaphylaxis.

EMA : Endomysial antibodies.

EOE : Eosinophilic oesophagitis.

EPIT : Epicutaneous immunotherapy.

ESPGHAN : The European Society for Pediatric Gastroenterology, Hepatology and Nutrition.

FA : Food allergy.

FAHF : Food allergy herbal formula.

FEV1 : Forced expiratory volume 1.

FPIES : Food protein-induced enterocolitis syndrome.

G6PD : Glucose-6-phosphate dehydrogenase.

GFD : Gluten free diet.

GI : Gastrointestinal.

GMP : Glycomacropeptide.

GOR : Gastro-oesophageal reflux.

HBT : Hydrogen Breath Test.

HLA : Human leukocyte antigen.

IC : Infantile colic.

ICMA : Intestinal cow's milk allergy.

IELs : Intraepithelial lymphocytes.

LC-PUFAs : Long-chain polyunsaturated fatty acids.

LCT : Lactase phlorizin hydrolase.

LHBT : Lactose hydrogen breath test.

LHP : Lactase phlorizin idrolase.

LNAA	**:**	Large Neutral Amino Acid.
LNP	**:**	Lactase non-persistence.
LPSs	**:**	Lipopolysaccharides.
LST	**:**	Lymphocyte stimulation test.
MHC	**:**	Major histocompatibility complex.
MICA	**:**	The major histocompatibility complex class I chain related gene A.
MMR	**:**	Measles mumps rubella vaccine.
NCGS	**:**	Non-coeliac gluten sensitivity.
NISs	**:**	Non-specific intestinal symptoms.
NRCD	**:**	Non-responsive CD.
nsLTP	**:**	Nonspecific lipid transfer protein.
OFC	**:**	Oral food challenge.
OFCT	**:**	Oral food challenge test.
OIT	**:**	Oral immunotherapy.
PAF	**:**	Platelet activating factor.
PAH	**:**	Phenylalanine hydroxylase.
PAL	**:**	Phenylalanine ammonia-lyase.
PCR-RFLP	**:**	Polymerase chain reaction-restriction fragment length polymorphism.
PEG-PAL	**:**	Polyethylene glycol of PAL.
PGE2	**:**	Prostaglandine E2.
Phe	**:**	Phenylalanine.
PHF	**:**	Partially hydrolyzed formulas.

PKU : Phenylketonuria.

PoCT : Point of Care Testing.

P-P : Prick-to-prick.

QoL : Quality of life.

RAST : Radio-allergosorbent test.

SCIT : Subcutaneous immunotherapy.

SGLT1 : Sodium dependent glucose transporter.

sIgE : Serum-specific Immunoglobulin E.

SLIT : Sublingual immunotherapy.

SNP : Single-nucleotide polymorphism.

SOTI : Specific oral tolerance induction.

SPT : Skin prick test.

TCR : T-cell receptor.

TG : Tight junction.

T-reg : T-regulatory cell.

tTG : Tissue transglutaminase.

WA : Wheat allergy.

WAO : World allergy organization.

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Introduction

An adverse food reaction consists of any abnormal reaction to the ingestion of food or additives, and it can be either toxic or nontoxic ***(Sicherer, 2011)***. Adverse reactions to food (AFR) in children are a source of increasing concern worldwide ***(Johansson et al., 2004)***.

A toxic reaction results from the pharmacologic actions of a substance within a food. These reactions can occur in anyone who is exposed to the food and do not depend on host factors. These substances may be enzymes or any agent that could cause reactions in the body. Examples of toxic reactions include nausea from bacterial food poisoning, heavy metal poisoning, and itching and flushing from histamine ingestion as seen in scombroid fish poisoning ***(Sicherer and Sampson, 2006)***.

Non-toxic food reactions can be subdivided into immunological (food allergy) and non-immunological (food intolerance); at the present these reactions are referred as: 'non-allergic food hypersensitivity' ***(Johansson et al., 2001)***. The occurrence of non-toxic reactions is highly individual, and depends on genetic, epigenetic and environmental factors, and adverse reactions generally do not occur in non-sensitive individuals even at relatively high exposures ***(Björkstén, 2005)***.

Food intolerance refers to an adverse physiologic response to a food and may be due to inherent properties of the food (i.e. toxic contaminant, pharmacologic active component) or to characteristics of the host (i.e. metabolic disorders, idiosyncratic responses, psychological disorder), they may not be reproducible, and they are often dose dependent. It is believed

that food intolerance represents the majority of the adverse reactions to food ***(Sicherer and Sampson, 2009)***.

Food allergy refers to an abnormal immunologic response to food that occurs in a susceptible host. Based on the immunological mechanism involved, food allergies may be further classified into a) IgE-mediated, which are mediated by antibodies belonging to the Immunoglobulin E (IgE) and are the best-characterized food allergy reactions; b) cell mediated when the cell component of the immune system is responsible of the food allergy and mostly involve the gastrointestinal tract; c) mixed IgE mediated-cell mediated when both IgE and immune cells are involved in the reaction ***(Sicherer and Sampson, 2009)***.

The prevalence of food allergy is highest in infants and toddlers (6-8%) and decreases slightly with age, affecting almost 4% of the adults ***(Pereira et al., 2005)***. In children, food allergy is the most common cause of anaphylaxis ***(Bock et al., 2001)***. Food allergy is the leading cause of anaphylaxis treated in hospital emergency departments in Western Europe and the United States. Food allergy alone in the United States appears to account for approximately 30000 anaphylactic reactions, 2000 hospitalizations, and possibly 200 deaths each year ***(Yocum et al., 1999)***. Many studies in the past few decades have shown that although 40%-60% of parents believed their child's symptoms are related to food consumption, only 4%-8% of children have symptoms reproduced by oral food challenges ***(Venter et al., 2006)***.