α1 isotype deficiency

GENERAL INFORMATION

Description:

Classification:

- Deficiencies predominantly affecting antibody production
  - Selective deficiency of IgG subclass, IgE and/or IgA class or subclass

Inheritance:

Autosomal recessive

OMIM:

- *146900 IgA constant heavy chain 1; IGHA1

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for α2 isotype deficiency

Incidence:

1: 250,000 in USA

CLINICAL INFORMATION

Description:

Most patients are healthy. Some patients develop symptoms later in life. Recurrent or chronic upper and lower respiratory tract infections leading to bronchiectasis or cor pulmonale are not common. G. lamblia infection of the gastrointestinal tract is common. Other gastrointestinal diseases that may occur are spruelike syndrome, ulcerative colitis, and Crohn disease. Autoimmune and collagen vascular diseases such as rheumatoid arthritis, systemic lupus erythematosus without renal disease, autoimmune hepatitis, hemolytic anemia, and endocrinopathies have been described. Patients with undetectable IgA antibodies may develop anti-IgA antibodies of the IgE isotype after receiving blood products. Once sensitized, these patients are at risk for anaphylactic reactions if they receive blood products containing even small amounts of IgA antibodies. Increased excretion of monomeric IgM in the secretions of certain patients may compensate for the lack of IgA, rendering patients less vulnerable to mucosal infections. The association of an IgG subclass deficiency, such as IgG2/IgG4 or IgG3, may worsen the situation.

Diagnosis:

Diagnostic laboratories:

Clinical:

- IgA and IgG subclass deficiencies, eMedicine
- Immunoglobulin A deficiency, eMedicine

Therapeutic options:

- There is no specific treatment. Products containing IgA should be avoided. Antibiotic therapy is the first line of treatment specific to respiratory or gastro-intestinal tract infections. In case it is required use (intravenous) Ig with a low content of IgA.
- Immunoglobulin A deficiency, eMedicine
- Hypogammaglobulinemia, eMedicine
- IgA and IgG subclass deficiencies, eMedicine

Research programs, clinical trials:

- European Initiative for Primary Immunodeficiencies
- Improved Healthcare for Patients with Primary Antibody Deficiencies through new Strategies Elucidating their Pathophysiology (IMPAD), IMPAD
- Immune Regulation in Patients with Common Variable Immunodeficiency and Related Syndromes, ClinicalTrials.gov

GENE INFORMATION

Names:

HUGO name: IGHA1
Alias(es): Immunoglobin heavy constant alpha 1, immunoglobulin alpha 1, Ig alpha-1 chain C region

Localization:

Reference sequences:

DNA: J00220 (EMBL) , **cDNA:** AK092384 (Genbank) , **Protein:** P01876 (SWISSPROT)

Chromosomal Location:

14q32.33

Maps:

IGHA1 (Map View)

Other gene-based resources:

Ensembl: OTTHUMG00000029954, GENATLAS: IGHA1, GeneCard: IGHA1, UniGene: 537772, Entrez Gene: 3493, euGenes: 3493, IMGT: IGHA1

PROTEIN INFORMATION

Description:

Protein function:

Ig# is the major immunoglobulin class in body secretions. It may serve both to defend against local infection and to prevent access of foreign antigens to the general immunologic system.

Subunit:

Monomeric or polymeric.

Other features:

Disulfide bond interchain (with a light chain): 14

Disulfide bond interchain (with heavy chain): 122

Disulfide bond or 123-182: 123-180

Disulfide bond interchain (with heavy chain): 182

Disulfide bond intersubunit bond: 192

Disulfide bond with j chain: 352

O-linked glycosylation site: 105

O-linked glycosylation site: 111

O-linked glycosylation site: 113

O-linked glycosylation site: 119

O-linked glycosylation site: 121

Disulfide bonds: 26-85, 77-101, 147-204, 250-313

Other related resourses:

PIR: A1HU, InterPro: IPR003006; Ig_MHC, InterPro: IPR003597; Ig_c1, Pfam: PF00047; ig, SMART: SM00407; IGc1, PROSITE: PS00290; IG_MHC

Expression pattern for human:

Tissue	Exp. (%)	Clones

Animal models:

Fly:

euGenes: ; Toll-7

OTHER RESOURCES

Societies:

General:

- International Patient Organization for Primary Immunodeficiencies
- Immune Deficiency Foundation
- March of Dimes Birth Defects Foundation
- NIH/National Institute of Allergy and Infectious Diseases
- European Society for Immunodeficiencies