

# Summary of Product Characteristics

## 1 NAME OF THE MEDICINAL PRODUCT

Panzyga, 100 mg/ml solution for infusion

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Human normal immunoglobulin (IVIg)

One ml contains:

Human normal immunoglobulin.....100 mg  
(Purity of at least 95 % IgG)

Each vial of 10 ml contains: 1 g of human normal immunoglobulin.

Each vial of 25 ml contains: 2.5 g of human normal immunoglobulin.

Each bottle of 50 ml contains: 5 g of human normal immunoglobulin.

Each bottle of 60 ml contains: 6 g of human normal immunoglobulin.

Each bottle of 100 ml contains: 10 g of human normal immunoglobulin.

Each bottle of 200 ml contains: 20 g of human normal immunoglobulin.

Each bottle of 300 ml contains: 30 g of human normal immunoglobulin.

Distribution of the IgG subclasses (approx. values):

IgG<sub>1</sub> 65 %

IgG<sub>2</sub> 28 %

IgG<sub>3</sub> 3 %

IgG<sub>4</sub> 4 %

The maximum IgA content is 300 micrograms/ml

Produced from the plasma of human donors.

### Excipient(s) with known effect

This medicinal product contains 69 mg sodium per vial of 100 ml equivalent to 3.45% of the WHO recommended maximum daily intake of 2 g sodium for an adult.

For a full list of excipients, see section 6.1.

## 3 PHARMACEUTICAL FORM

Solution for infusion

The solution is clear or slightly opalescent and colourless or pale yellow. The pH of the solution is 4.5 to 5.0, the osmolality is  $\geq$  240 mosmol/kg.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic Indications

Replacement therapy in adults, and children and adolescents (0-18 years) in:

- Primary immunodeficiency syndromes (PID) with impaired antibody production.
- Secondary immunodeficiencies (SID) in patients who suffer from severe or recurrent infections, ineffective antimicrobial treatment and either proven specific antibody failure (PSAF)\* or serum IgG level of <4g/l.

\*PSAF=failure to mount at least a 2-fold rise in IgG antibody titre to pneumococcal polysaccharide and polypeptide antigen vaccines

Immunomodulation in adults, and children and adolescents (0-18 years) in:

- Primary immune thrombocytopenia (ITP), in patients at high risk of bleeding or prior to surgery to correct the platelet count
- Guillain Barré syndrome
- Kawasaki disease (in conjunction with acetylsalicylic acid; see 4.2)
- Chronic inflammatory demyelinating polyradiculoneuropathy (CIDP)
- Multifocal motor neuropathy (MMN)

## 4.2 Posology and method of administration

Replacement therapy should be initiated and monitored under the supervision of a physician experienced in the treatment of immunodeficiency.

### Posology

The dose and dose regimen are dependent on the indication.

The dose may need to be individualised for each patient dependent on the clinical response. Dose based on bodyweight may require adjustment in underweight and overweight patients. In overweight patients dose should be based on the physiological standard bodyweight.

The following dose regimens are given as a guideline.

#### *Replacement therapy in primary immunodeficiency (PID) syndromes*

The dose regimen should achieve a trough level of IgG (measured before the next infusion) of at least 6 g/l or within the normal reference range for the population age. Three to six months are required after the initiation of therapy for equilibration (steady-state IgG levels) to occur. The recommended starting dose is 0.4–0.8 g/kg given once, followed by at least 0.2 g/kg given every three to four weeks.

The dose required to achieve a trough level of 6 g/l is of the order of 0.2-0.8 g/kg/month. The dosage interval when steady state has been reached varies from 3 - 4 weeks.

IgG trough levels should be measured and assessed in conjunction with the incidence of infection. To reduce the rate of bacterial infections, it may be necessary to increase the dosage and aim for higher trough levels.

#### *Secondary immunodeficiencies (as defined in 4.1.)*

The recommended dose is 0.2-0.4 g/kg every three to four weeks.

IgG trough levels should be measured and assessed in conjunction with the incidence of infection. Dose should be adjusted as necessary to achieve optimal protection against infections, an increase may be necessary in patients with persisting infection; a dose decrease can be considered when the patient remains infection free.

#### *Primary immune thrombocytopenia (ITP)*

There are two alternative treatment schedules:

- 0.8–1g/kg given on day one; this dose may be repeated once within 3 days
- 0.4 g/kg given daily for two to five days.

The treatment can be repeated if relapse occurs.

#### *Guillain Barré syndrome*

0.4 g/kg/day over 5 days (possible repeat of dosing in case of relapse).

#### *Kawasaki Disease*

2.0 g/kg should be administered as a single dose. Patients should receive concomitant treatment with acetylsalicylic acid.

#### *Chronic inflammatory demyelinating polyneuropathy (CIDP)*

Starting dose: 2g/kg divided over 2-5 consecutive days.

Maintenance doses:

1 g/kg over 1-2 consecutive days every 3 weeks.

The treatment effect should be evaluated after each cycle; if no treatment effect is seen after 6 months, the treatment should be discontinued.

If the treatment is effective, long-term treatment should be subject to the physician's discretion based upon the patient's response and maintenance response. The dosing and intervals may have to be adapted according to the individual course of the disease.

#### *Multifocal Motor Neuropathy (MMN)*

Starting dose: 2g/kg given over 2-5 consecutive days

Maintenance dose: 1 g/kg every 2 to 4 weeks or 2 g/kg every 4 to 8 weeks.

The treatment effect should be evaluated each cycle; if no treatment effect is seen after 6 months, the treatment should be discontinued.

If the treatment is effective, long-term treatment should be subject to the physician's discretion based upon the patient's response and maintenance response. The dosing and intervals may have to be adapted according to the individual course of the disease.

The dosage recommendations are summarised in the following table:

<b>Indication</b>	<b>Dose</b>	<b>Frequency of injection</b>
Replacement therapy		
Primary immunodeficiency syndromes	Starting dose: 0.4–0.8 g/kg  Maintenance dose: 0.2–0.8 g/kg	every 3–4 weeks
Secondary immunodeficiency (as defined in 4.1.)	0.2–0.4 g/kg	every 3–4 weeks
Immunomodulation		
Primary immune thrombocytopenia	0.8–1 g/kg or 0.4 g/kg/d	on day 1, possibly repeated once within 3 days  for 2–5 days
Guillain Barré syndrome	0.4 g/kg/d	for 5 days
Kawasaki disease	2 g/kg	in one dose in association with acetylsalicylic acid
Chronic inflammatory demyelinating polyneuropathy (CIDP)	Starting dose: 2g/kg  Maintenance dose: 1g/kg	in divided doses over 2-5 days  every 3 weeks over 1-2 days
Multifocal Motor Neuropathy (MMN)	Starting dose: 2 g/kg  Maintenance dose: 1g/kg or 2g/kg	over 2-5 consecutive days  every 2-4 weeks or every 4-8 weeks over 2-5 days

#### *Paediatric population*

The posology in children and adolescents (0–18 years) is not different to that of adults as the posology for each indication is given by body weight and adjusted to the clinical outcome of the above mentioned conditions.

#### Hepatic impairment

No evidence is available to require a dose adjustment.

**Renal impairment**

No dose adjustment unless clinically warranted, see section 4.4.

**Elderly**

No dose adjustment unless clinically warranted, see section 4.4.

**Method of administration**

For intravenous use.

Human normal immunoglobulin should be infused intravenously at an initial rate of 0.6 ml/kg/hr for 30 min. See section 4.4. In case of adverse reaction, either the rate of administration must be reduced or the infusion stopped. If well tolerated, the rate of administration may gradually be increased to a maximum of 4.8 ml/kg/hr.

In PID patients who have tolerated the infusion rate of 4.8 ml/kg/hr well, the rate may be further increased gradually to a maximum of 8.4 ml/kg/hr.

In order to infuse any product that may remain in the infusion tubing at the end of the infusion the tubing may be flushed with either 0.9% saline or 5% dextrose solution.

**4.3 Contraindications**

Hypersensitivity to the active substance (human immunoglobulins) or to any of the excipients (see section 4.4 and 6.1).

Patients with selective IgA deficiency who developed antibodies to IgA, as administering an IgA-containing product can result in anaphylaxis.

**4.4 Special warnings and precautions for use***Traceability*

*In order to improve the traceability of biological medicinal products, the name and the batch number of the administered product should be clearly recorded.*

*Precautions for use*

Potential complications can often be avoided by ensuring that patients:

- are not sensitive to human normal immunoglobulin by initially injecting the product slowly (0.6-1.2 ml/kg/hr).
- are carefully monitored for any symptoms throughout the infusion period. In particular, patients naive to human normal immunoglobulin, patients switched from an alternative IVIg product or when there has been a long interval since the previous infusion should be monitored during the first infusion and for the first hour after the first infusion, in order to detect potential adverse signs. All other patients should be observed for at least 20 minutes after administration.

In all patients, IVIg administration requires:

- adequate hydration prior to the initiation of the infusion of IVIg
- monitoring of urine output
- monitoring of serum creatinine levels
- avoidance of concomitant use of loop diuretics (see 4.5).

In case of adverse reaction, either the rate of administration must be reduced or the infusion stopped. The treatment required depends on the nature and severity of the adverse reaction.

**Infusion reaction**

Certain adverse reactions (e.g. headache, flushing, chills, myalgia, wheezing, tachycardia, lower back pain, nausea, and hypotension) may be related to the rate of infusion. The recommended infusion rate given under section 4.2 must be closely followed. Patients must be closely monitored and carefully observed for any symptoms throughout the infusion period.

Adverse reactions may occur more frequently:

- in patients who receive human normal immunoglobulin for the first time or, in rare cases, when the human normal immunoglobulin product is switched or when there has been a long interval since the previous infusion.
- in patients with an untreated infection or underlying chronic inflammation

### Hypersensitivity

Hypersensitivity reactions are rare.

Anaphylaxis can develop in patients

- with undetectable IgA who have anti-IgA antibodies
- who had tolerated previous treatment with human normal immunoglobulin

In case of shock, standard medical treatment for shock should be implemented.

### Thromboembolism

There is clinical evidence of an association between IVIg administration and thromboembolic events such as myocardial infarction, cerebral vascular accident (including stroke), pulmonary embolism and deep vein thromboses which is assumed to be related to a relative increase in blood viscosity through the high influx of immunoglobulin in at-risk patients. Caution should be exercised in prescribing and infusing IVIg in obese patients and in patients with pre-existing risk factors for thrombotic events (such as advanced age, hypertension, diabetes mellitus and a history of vascular disease or thrombotic episodes, patients with acquired or inherited thrombophilic disorders, patients with prolonged periods of immobilisation, severely hypovolaemic patients, patients with diseases which increase blood viscosity).

In patients at risk for thromboembolic adverse reactions, IVIg products should be administered at the minimum rate of infusion and dose practicable.

### Acute renal failure

Cases of acute renal failure have been reported in patients receiving IVIg therapy. In most cases, risk factors have been identified, such as pre-existing renal insufficiency, diabetes mellitus, hypovolaemia, overweight, concomitant nephrotoxic medicinal products or age over 65.

Renal parameters should be assessed prior to infusion of IVIG, particularly in patients judged to have a potential increased risk for developing acute renal failure, and again at appropriate intervals. In patients at risk for acute renal failure, IVIg products should be administered at the minimum rate of infusion and dose practicable. In case of renal impairment, IVIg discontinuation should be considered.

While these reports of renal dysfunction and acute renal failure have been associated with the use of many of the licensed IVIg products containing various excipients such as sucrose, glucose and maltose, those containing sucrose as a stabiliser accounted for a disproportionate share of the total number. In patients at risk, the use of IVIg products that do not contain these excipients may be considered. Panzyga does not contain sucrose, maltose or glucose.

### Aseptic meningitis syndrome (AMS)

Aseptic meningitis syndrome has been reported to occur in association with IVIg treatment. The syndrome usually begins within several hours to 2 days following IVIg treatment. Cerebrospinal fluid studies are frequently positive with pleocytosis up to several thousand cells per mm<sup>3</sup>, predominantly from the granulocytic series, and elevated protein levels up to several hundred mg/dl.

AMS may occur more frequently in association with high-dose (2 g/kg) IVIg treatment.

Patients exhibiting such signs and symptoms should receive a thorough neurological examination, including CSF studies, to rule out other causes of meningitis.

Discontinuation of IVIg treatment has resulted in remission of AMS within several days without sequelae.

### Haemolytic anaemia

IVIg products can contain blood group antibodies which may act as haemolysins and induce *in vivo* coating of red blood cells with immunoglobulin, causing a positive direct antiglobulin reaction (Coombs' test) and, rarely, haemolysis. Haemolytic anaemia can develop subsequent to IVIg therapy due to enhanced red blood cells (RBC) sequestration. IVIg recipients should be monitored for clinical signs and symptoms of haemolysis (see section 4.8).

#### Neutropenia/Leukopenia

A transient decrease in neutrophil count and/or episodes of neutropenia, sometimes severe, have been reported after treatment with IVIg. This typically occurs within hours or days after IVIg administration and resolves spontaneously within 7 to 14 days.

#### Transfusion related acute lung injury (TRALI)

In patients receiving IVIg, there have been some reports of acute non-cardiogenic pulmonary oedema [Transfusion Related Acute Lung Injury (TRALI)]. TRALI is characterised by severe hypoxia, dyspnoea, tachypnoea, cyanosis, fever and hypotension. Symptoms of TRALI typically develop during or within 6 hours of a transfusion, often within 1-2 hours. Therefore, IVIg recipients must be monitored for and IVIg infusion must be immediately stopped in case of pulmonary adverse reactions. TRALI is a potentially life-threatening condition requiring immediate intensive-care-unit management.

#### Interference with serological testing

After the administration of immunoglobulin the transitory rise of various passively transferred antibodies in the patient's blood may result in misleading positive results in serological testing.

Passive transmission of antibodies to erythrocyte antigens, e.g. A, B, D may interfere with some serological tests for red cell antibodies for example the direct antiglobulin test (DAT, direct Coombs' test).

#### Transmissible agents

Standard measures to prevent infections resulting from the use of medicinal products prepared from human blood or plasma include selection of donors, screening of individual donations and plasma pools for specific markers of infection and the inclusion of effective manufacturing steps for the inactivation/removal of viruses. Despite this, when medicinal products prepared from human blood or plasma are administered, the possibility of transmitting infective agents cannot be totally excluded. This also applies to unknown or emerging viruses and other pathogens.

The measures taken are considered effective for enveloped viruses such as HIV, HBV and HCV and for the non-enveloped viruses HAV and parvovirus B19.

There is reassuring clinical experience regarding the lack of hepatitis A or parvovirus B19 transmission with immunoglobulins and it is also assumed that the antibody content makes an important contribution to the viral safety.

#### Important information on some of the ingredients of Panzyga

This medicinal product contains 69 mg sodium per vial of 100 ml equivalent to 3.45% of the WHO recommended maximum daily intake of 2 g sodium for an adult.

#### Paediatric population

The listed warnings and precautions apply both to adults and children.

### **4.5 Interaction with other medicinal products and other forms of interactions**

#### Live attenuated virus vaccines

Immunoglobulin administration may impair for a period of at least 6 weeks and up to 3 months the efficacy of live attenuated virus vaccines such as measles, rubella, mumps and varicella. After administration of this medicinal product, an interval of 3 months should elapse before vaccination with live attenuated virus vaccines. In the case of measles, this impairment may persist for up to 1 year. Therefore, patients receiving measles vaccine should have their antibody status checked.

#### Loop diuretics

Avoidance of concomitant use of loop diuretics

#### Paediatric population

The listed interactions apply both to adults and children.

### 4.6 Fertility, pregnancy and lactation

#### Pregnancy

The safety of this medicinal product for use in human pregnancy has not been established in controlled clinical trials and therefore should only be given with caution to pregnant women and breast-feeding mothers. IVIg products have been shown to cross the placenta, increasingly during the third trimester. Clinical experience with immunoglobulins suggests that no harmful effects on the course of pregnancy, or on the foetus and the neonate are to be expected.

#### Breast-feeding

Immunoglobulins are excreted into the milk. No negative effects on the breastfed newborns/infants are anticipated.

#### Fertility

Clinical experience with immunoglobulins suggests that no harmful effects on fertility are to be expected.

### 4.7 Effects on ability to drive and use machines

Panzyga has no or negligible influence on the ability to drive and use machines. However, patients who experience adverse reactions during treatment should wait for these to resolve before driving or operating machines.

### 4.8 Undesirable effects

#### Summary of the safety profile

Adverse reactions caused by human normal immunoglobulins (in decreasing frequency) encompass (see also Section 4.4):

- chills, headache, dizziness, fever, vomiting, allergic reactions, nausea, arthralgia, low blood pressure and moderate low back pain
- reversible haemolytic reactions; especially in those patients with blood groups A, B, and AB and (rarely) haemolytic anaemia requiring transfusion.
- (rarely) a sudden fall in blood pressure and, in isolated cases, anaphylactic shock, even when the patient has shown no hypersensitivity to previous administration.
- (rarely) transient cutaneous reactions (including cutaneous lupus erythematosus - frequency unknown)
- (very rarely) thromboembolic reactions such as myocardial infarction, stroke, pulmonary embolism, deep vein thromboses
- cases of reversible aseptic meningitis
- cases of increased serum creatinine level and/or occurrence of acute renal failure
- cases of Transfusion Related Acute Lung Injury (TRALI)

#### Tabulated list of adverse reactions

The table presented below is according to the MedDRA system organ classification (SOC and Preferred Term Level).

Frequencies have been evaluated according to the following convention: very common ( $\geq 1/10$ ); common ( $\geq 1/100$  to  $< 1/10$ ); uncommon ( $\geq 1/1,000$  to  $< 1/100$ ); rare ( $\geq 1/10,000$  to  $< 1/1,000$ ); very rare ( $< 1/10,000$ ), not known (cannot be estimated from the available data).

Within each Organ Class, adverse reactions are presented in order of decreasing seriousness.

Frequency of adverse drug reactions in clinical studies with Panzyga:

MedDRA System Organ Class (SOC) according to the sequence:	Adverse Reaction	Frequency per Infusion	Frequency per patient
Blood and lymphatic system disorders	Haemolysis, anaemia, leukopenia	Uncommon	common

Nervous system disorders	Headache ----- -----	Common	Very common
	Aseptic meningitis, hypoaesthesia, dizziness	----- ----- Uncommon	----- ----- Common
Eye disorders	Eye pruritus	Uncommon	Common
Ear and labyrinth disorders	Ear pain	Uncommon	Common
Cardiac disorders	Tachycardia	Uncommon	Common
Vascular disorders	Hypertension	Uncommon	Common
Respiratory, thoracic and mediastinal disorders	Cough	Uncommon	Common
Gastrointestinal disorders	Nausea ----- -----	Common	Very common
	Vomiting, abdominal pain, abdominal discomfort	----- ----- Uncommon	----- ----- Common
Skin and subcutaneous tissue disorders	Rash	Uncommon	Common
Musculoskeletal and connective tissue disorders	Arthralgia, myalgia, musculoskeletal pain or stiffness	Uncommon	Common
General disorders and administration site conditions	Pyrexia ----- -----	Common	Very common
	Chills, chest pain, pain, feeling cold, asthenia, fatigue, infusion site pruritus	----- ----- Uncommon	----- ----- Common
Investigations	Hepatic enzyme increased	Uncommon	Common

† subclinical case

The following reactions have been reported from post-marketing experience with Panzyga  
Frequency for reported post marketing reactions cannot be estimated from the available data.

<b>MedDRA System Organ Class (SOC) according to the sequence:</b>	<b>Adverse reaction (PT)</b>	<b>Frequency</b>
Immune system disorders	Anaphylactic reaction, hypersensitivity	Not Known
Psychiatric disorders	Anxiety	Not Known
Nervous system disorders	Hypoaesthesia, paraesthesia, tremor	Not Known
Cardiac disorders	Tachycardia	Not Known
Vascular disorders	Hypertension	Not Known
Respiratory disorders, thoracic and mediastinal disorders	Cough, dyspnoea	Not Known
Gastrointestinal disorders	Abdominal pain, diarrhoea	Not Known
Skin and subcutaneous tissue disorders	Erythema, pruritus, rash, urticaria	Not Known
Musculoskeletal and connective tissue disorders	Muscle spasms, neck pain, pain in extremity	Not Known
General disorders and administration site conditions	Asthenia, chest discomfort, chest pain, fatigue, feeling hot, malaise	Not Known

The following reactions have been reported to occur with IVIg treatment and can also occur after Panzyga administration:

<b>MedDRA System Organ Class</b>	<b>Adverse Reactions</b>
Blood and lymphatic system disorders	Pancytopenia
Immune system disorders	Anaphylactoid reaction, angioneurotic oedema, face oedema
Metabolic and nutritional disorders	Fluid overload, (pseudo)hyponatraemia



Psychiatric disorders	Agitation, confusional state, nervousness
Nervous system disorders	Cerebrovascular accident, coma, loss of consciousness, convulsion, encephalopathy, migraine, speech disorder, photophobia
Cardiac disorders	Cardiac arrest, angina pectoris, bradycardia, palpitations, cyanosis
Vascular disorders	Peripheral circulatory failure or collapse, phlebitis, pallor
Respiratory, thoracic and mediastinal disorders	Respiratory failure, apnoea, acute respiratory distress syndrome, pulmonary oedema, bronchospasm, hypoxia, wheezing
Hepatobiliary disorders	Hepatic dysfunction
Skin and subcutaneous tissue disorders	Steven-Johnson syndrome, epidermolysis, skin exfoliation, eczema, (bullous) dermatitis, alopecia
Renal and urinary disorders	Renal pain
General disorders and administration site conditions	Injection site reaction, hot flush, flu-like illness, flushing, oedema, lethargy, burning sensation, hyperhidrosis
Investigations	Coombs' direct test positive, falsely elevated erythrocyte sedimentation rate, oxygen saturation decreased

#### Description of selected adverse reactions

For description of selected adverse events, such as hypersensitivity reactions, thromboembolism, acute renal failure, aseptic meningitis syndrome, and haemolytic anaemia, see section 4.4.

#### Paediatric population

Frequency, type and severity of adverse reactions in children were the same as in adults.

#### Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Health care professionals are asked to report any suspected adverse reactions via HPRA Pharmacovigilance (website: [www.hpra.ie](http://www.hpra.ie)).

## 4.9 Overdose

Overdose may lead to fluid overload and hyperviscosity, particularly in patients at risk, including elderly patients or patients with cardiac or renal impairment (see section 4.4).

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: immune sera and immunoglobulins: immunoglobulins, normal human, for intravascular administration, ATC-Code: J06B A02.

Human normal immunoglobulin contains mainly immunoglobulin G (IgG) with a broad spectrum of antibodies against infectious agents.

Human normal immunoglobulin contains the IgG antibodies present in the normal population. It is usually prepared from pooled plasma from not fewer than 1000 donations. It has a distribution of immunoglobulin G subclasses closely proportional to that in native human plasma. Adequate doses of this medicinal product may restore abnormally low immunoglobulin G levels to the normal range.

The mechanism of action in indications other than replacement therapy is not fully elucidated.

#### Clinical Studies

A prospective, open-label, non-controlled study was done in 51 patients with primary immunodeficiency syndromes. The patients were recruited into 3 age strata ( $\geq 2$  years and  $< 12$  years of age,  $\geq 12$  years and  $< 16$  years of age, and  $\geq 16$  years and  $\leq 75$  years). The primary endpoint of the study was the rate of serious bacterial infections (SBI) per person-year on treatment. Patients received a total of 17 or 13 infusions of Panzyga over the course of this study, depending on whether their regular treatment intervals were every 3 or 4 weeks, respectively. The dose was 0.2-0.8 g/kg to be infused at increasing infusion rates up to a maximum of 0.08 ml/kg/min. Two patients experienced 4 SBIs. With altogether 49.2 patient exposure years, the result of this primary endpoint was 0.08 SBIs/patient exposure year with an upper 99% confidence interval limit of 0.5. Also the other efficacy parameters calculated by patient exposure year, such as other infections and days with use of antibiotics, absence from school or work, and hospitalised due to infection, were in line with what has been published for other IVIGs previously developed.

This study was followed by an extension study which was carried out in order to assess the tolerability of Panzyga when administered at higher infusion rates (from 0.08 ml/kg/min up to 0.14 ml/kg/min). In total, 21 patients were enrolled. The product was well tolerated and all patients completed the study as planned. Study medication related AEs were reported in 2 children and 2 adults; the most commonly reported reactions were nausea and headache.

A further prospective, open-label, non-controlled study was done in 40 patients with immune thrombocytopenic purpura of at least 12 months duration. Patients received a daily dose of 1 g/kg for 2 consecutive days. Alternative response (AR) according to the EMA Guideline was defined as an increase in platelet count to  $\geq 30 \times 10^9/L$  and to at least double the baseline platelet count, confirmed on at least 2 separate occasions at least 7 days apart, and absence of bleeding. An AR was observed in 24 patients (66.7%).

Complete response (CR) according to the EMA Guideline was defined as the achievement of platelet counts  $\geq 100 \times 10^9/L$ , to be fulfilled on at least 2 separate visits at least 7 days apart without new bleedings. CR was observed in 18 patients (50.0%).

Loss of AR/CR was applied if the criteria for AR/CR were fulfilled but deteriorated afterwards as a decrease in platelet count to  $< 30 \times 10^9/L$  (AR) or  $< 100 \times 10^9/L$  (CR) or a decrease in platelet count to less than double the baseline count or as occurrence of bleeding. Regarding loss of AR, 11 of 24 patients (45.8%) who fulfilled the AR criteria had a loss of response. Loss of CR was seen for 14 of 18 patients (77.8%) who fulfilled the CR criteria.

For safety information derived from clinical studies please see Section 4.8.

#### Paediatric Population

There were no major differences in the proportion of children or adolescent patients with AEs compared with adults. AEs related to the system organ class infections and infestations were the most commonly AEs met in all age groups; however, they were reported in a higher percentage of children and adolescent patients. The same difference was noted for gastrointestinal disorders AEs. It was also noticed a higher percentage of patients in children age group having AEs from the system organ class skin and subcutaneous tissue disorders.

## 5.2 Pharmacokinetic properties

Human normal immunoglobulin is immediately and completely bioavailable in the recipient's circulation after intravenous administration. It is distributed relatively rapidly between plasma and extravascular fluid, after approximately 3–5 days equilibrium is reached between the intra- and extravascular compartments.

Panzyga has an average half-life of about 26–39 days. This half-life may vary from patient to patient, in particular in primary immunodeficiency.

IgG and IgG-complexes are broken down in cells of the reticuloendothelial system.

#### Paediatric Population

The results of the pharmacokinetic studies in the different paediatric age groups are summarized in the following table, with a comparison to adults.

*Overview on Pharmacokinetic Characteristics of Total IgG for Panzyga Divided by Different Age Groups (median values)*

<i>Parameter</i>	<i>Unit</i>	<i>Paediatric Population</i>		<i>Adults</i>	<i>All Age Groups</i>
		<i>Children</i>	<i>Adolescents</i>		
		$\geq 2$ to $< 12$ yrs	$\geq 12$ to $< 16$ yrs	$\geq 16$ to $\leq 75$ yrs	
		<i>N=13</i>	<i>N=12</i>	<i>N=26</i>	<i>N=51</i>
$C_{max}$	g/L	18.6	19.3	17.1	18.2
$C_{min}$	g/L	10.7	9.3	10.1	9.9
[range]		[7.2 – 16.8]	[7.4 – 20.4]	[6.8 – 20.6]	[6.8 – 20.6]
$AUC_{0-\tau}$	h•g/L	6957	6826	7224	7182
$t_{1/2}$	days	36	33	37	36

## 5.3 Preclinical safety data

Immunoglobulins are normal constituents of the human body.

The safety of Panzyga has been demonstrated in several non-clinical safety pharmacology (cardiovascular, respiratory, and bronchospastic effects, thrombogenic potential) and toxicology studies (acute toxicity, local tolerance). The non-clinical data reveal no special risk for humans based on these conventional safety pharmacology and toxicity studies. Studies of repeated dose toxicity, genotoxicity, and toxicity to reproduction in animals are impracticable due to induction of and interference by developing antibodies to heterologous proteins. Since clinical experience provides no evidence for carcinogenic potential of immunoglobulins, no experimental genotoxicity/carcinogenicity studies in heterogeneous species were performed.

## 6 PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

Glycine, Water for injections

### 6.2 Incompatibilities

In the absence of incompatibility studies, this medicinal product must not be mixed with other medicinal products, nor with any other IVIg products.

### 6.3 Shelf life

3 years.

### 6.4 Special precautions for storage

Store in a refrigerator (2°C–8°C). Do not freeze. Keep the container in the outer carton in order to protect from light. The product may be stored at temperatures above +8°C and below +25°C for up to 12 months, without being refrigerated again during this period, and it must be discarded if not used after this.

### 6.5 Nature and contents of container

Pack sizes:

1 g in 10 ml in a 20 ml vial

2.5 g in 25 ml in a 30 ml vial

5 g in 50 ml in a 70 ml bottle

6 g in 60 ml in a 70 ml bottle

10 g in 100 ml in a 100 ml bottle

3 x 10 g in 3 x 100 ml in a 100 ml bottle

20 g in 200 ml in a 250 ml bottle

3 x 20 g in 3 x 200 ml in a 250 ml bottle

30 g in 300 ml in a 300 ml bottle

Not all pack sizes may be marketed.

The vials/bottles are made of type II glass closed with bromobutyl rubber stoppers and sealed with aluminium flip-off caps.

### 6.6 Special precautions for disposal and other handling

The product should be brought to room or body temperature before use.

The solution should be clear or slightly opalescent and colourless or pale yellow.

Solutions that are cloudy or have deposits should be not used.

Any unused product or waste material should be disposed of in accordance with local requirements.

Due to the possibility of bacterial contamination, any remaining contents must be discarded.

## **7 MARKETING AUTHORISATION HOLDER**

Octapharma (IP) SPRL  
Allée de la Recherche 65  
1070 Anderlecht  
Belgium

## **8 MARKETING AUTHORISATION NUMBER**

PA2219/010/001

## **9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION**

Date of first authorisation: 15<sup>th</sup> April 2016

Date of last renewal: 4<sup>th</sup> February 2021

## **10 DATE OF REVISION OF THE TEXT**

March 2021