National Agency for Food & Drug Administration & Control (NAFDAC)

Registration & Regulatory Affairs (R & R) Directorate

SUMMARY OF PRODUCT CHARACTERIZATION (SMPC)

FOR

JESSY HEMOGLOBIN PLUS SYRUP

1. Name of the medicinal product

Jessy Hemoglobin Plus Syrup

2. Qualitative and quantitative composition

Each 10ml contains
Hemoglobin 375mg
Chelated iron 10mg
Biotin……..7mcg
Vitamin B1…….1mcg
Vitamin B2…….1mcg
Vitamin B3…….5mg
Vitamin B12…….40mcg
Vitamin A……100mcg
Vitamin D3……..100mcg
Vitamin E……..5mg
Zinc Gluconate……..10mg
For a full list of excipients, see section 6.1

3. Pharmaceutical form

Oral Liquid

A dark brown viscous liquid with a faint chocolate flavour

4. Clinical particulars

4.1 Therapeutic indications

Jessy hemoglobin Plus Syrup is indicated for

- the prevention of vitamin deficiencies and for the maintenance of normal growth and health during the early years of infancy and childhood; multivitamin supplement
- Iron deficiency anaemia due to chronic blood loss, hook-worm infestation, inadequate intake of iron, etc.
- Dimorphic anaemia due to deficiency of Iron, Folic Acid and /or Vitamin B12 (Cyanocobalamin).
- Anemia of pregnancy and lactation.
- As a therapeutic nutritional adjunct in conditions where the absorption of vitamins and minerals is suboptimal, e.g. malabsorption, inflammatory bowel disease and fistulae, short bowel syndrome and Crohn's disease, and where concurrent medication decreases vitamin and mineral absorption
- Tonic in general weakness, lack of appetite, rundown conditions and convalescence. • Post surgery and other debilitated states.

4.2 Posology and method of administration

For oral administration:

Adults

2 teaspoonful 4 times daily

Children (5-12 years)

1 teaspoonful 4 times daily

Children (2-5 years)

1 teaspoonful 2 times daily

4.3 Contraindications

Hypersensitivity to any of the ingredients. Pantothenol is contra-indicated in haemophiliacs and in patients with ileus due to mechanical obstruction.

4.4 Special warnings and precautions for use

When prescribing this Syrup, as with all multi-vitamin preparations, allowance should be made for vitamins obtained from other sources. While children are taking Multivitamin Syrup no other vitamin supplement containing vitamins A and D should be taken unless under medical supervision.

4.5 Interaction with other medicinal products and other forms of interaction

If you use other drugs or over the counter products at the same time, the effects of Jessy Hemoglobin Syrup may change. This may increase your risk for side-effects or cause your drug not to work properly. Tell your doctor about all the drugs, vitamins, and herbal supplements you are using, so that you doctor can help you prevent or manage drug interactions. Jessy Hemoglobin Syrup may interact with the following drugs and products:

- Arsenic trioxide
- Chloramphenicol
- Folic acid
- Furosemide
- Gabapentin
- Hydrochlorothiazide
- Levothyroxine
- Lisinopril

Compounds containing Calcium and Magnesium including antacids and mineral supplements and bicarbonates, carbonates, oxalates or phosphates, may also impair the absorption of iron by the formation of insoluble complexes.

Similarly, absorption of both iron & tetracyclines is diminished when they are taken concomitantly by mouth. If treatment with both drugs is required, a time interval of about 2 to 3 hours should be allowed between them.

- Avoid milk and dairy products at least for 2 hours.
- Some agents such as Ascorbic Acid & Citric Acid may actually increase the absorption of iron.

- The response to iron may be delayed in patients receiving concomitant parenteral chloramphenicol therapy.
- Iron salts can decrease the absorption of bisphosphonates, fluoroquinolones, levodopa, methyldopa, penicillamine and tetracycline.
- Iron salts may reduce the efficacy of thyroxine.

4.6 Fertility, pregnancy and lactation

Can be used in Iron deficiency anaemia during Pregnancy and Lactation after considering risk benefit ratio

4.7 Effects on ability to drive and use machines

Jessy Heamoglobin Plus Syrup has no influence on the ability to drive or use machines.

4.8 Undesirable effects

Hemoglobin

These side-effects are possible, but do not always occur. Some of the side-effects may be rare but serious. Consult your doctor if you observe any of the following side-effects, especially if they do not go away.

Diarrhea

Swelling

Rapid weight gain

Itching or mild rash

Jessy Hemoglobin Syrup may also cause side-effects not listed here.

Ferric Ammonium Citrate:

In high or toxic doses or poisoning - Gastrointestinal irritation, abdominal pain with nausea, vomiting and either diarrhoea or constipation. Cardiovascular disorders such as hypotension, tachycardia, metabolic changes including acidosis and hypoglycemia. CNS depression ranging from lethargy to coma.

Vitamin A:

Absorption of vitamin A from the gastro-intestinal tract may be reduced by the presence of neomycin, cholestyramine, or liquid paraffin; absorption may also be impaired in cholestatic jaundice and fat-malabsorption conditions

Vitamin B1:

Thiamine (the active ingredient contained in Vitamin B1) may cause some unwanted effects. Although not all of these side effects may occur, if they do occur they may need medical attention.

Almost nontoxic in man and no adverse effects have been reported except a rare and doubtful allergic reaction like skin rash, itching, hives, swelling of the face, lips, tongue, or throat

Vitamin B2:

Almost nontoxic in man and no adverse effects have been reported except a rare and doubtful allergic reaction like skin rash, itching, hives, swelling of the face, lips, tongue, or throat

Vitamin B3:

Vitamin B3 is likely safe for most people when taken by mouth. A common minor side effect of niacin is a flushing reaction. This might cause burning, tingling, itching, and redness of the face, arms, and chest, as well as headaches.

Vitamin B6:

When taken by mouth: Vitamin B6 is likely safe when used appropriately. Taking vitamin B6 in doses of 100 mg daily or less is generally considered to be safe. Vitamin B6 is possibly safe when taken in doses of 101-200 mg daily. In some people, vitamin B6 might cause nausea, stomach pain, loss of appetite, headache, and other side effects. Vitamin B6 is possibly unsafe when taken in doses of 500 mg or more daily. High doses of vitamin B6, especially 1000 mg or more daily, might cause brain and nerve problems.

Vitamin C:

Large doses may cause diarrhoea and other gastro-intestinal disturbances and are associated with the formation of renal calcium oxalate calculi. Vitamin C should be given with care to patients with hyperoxaluria. Tolerance may be induced with prolonged use of large doses

Cyanocobalamin:

No known side effects even with very large doses.

Vitamin D:

Should not be administered to patients with hypercalcaemia, and be given with caution to infants, as they may have increased sensitivity to its effects. The effects of Vitamin D may be reduced in patients taking barbiturates or anticonvulsants.

Biotin

There are currently no known adverse side effects of biotin when taken as prescribed by a doctor or through normal dietary intake.

Zinc Gluconate:

Zinc supplements are generally well tolerated, though they've been associated with adverse side effects like nausea, vomiting, diarrhea, and stomach pain in some people.

4.9 Overdose

The most sign & Symptoms of overdosage are Gastrointestinal irritation, abdominal pain with nausea, vomiting and either diarrhoea or constipation. Cardiovascular disorders such as

hypotension, tachycardia, metabolic changes including acidosis and hypoglycemia. CNS depression ranging from lethargy to coma.

Vomiting is induced immediately followed by parenteral injection of desferroxamine mesylate and then gastric lavage. In the meantime, give milk and/or 5% sodium bicarbonate solution by mouth. Fluid replacement is essential. Other measures include symptomatic management and therapy of metabolic and cardiovascular disorders.

5. Pharmacological properties

5.1 Pharmacodynamic properties

The following account summarises the pharmacological effects of the vitamins and minerals in Jessy Hemoglobin Plus Syrup and describes the conditions caused by deficiency of these.

Vitamin A

Vitamin A plays an important role in the visual process. It is isomerised to the 11-cis isomer and subsequently bound to the opsin to form the photoreceptor for vision under subdued light. One of the earliest symptoms of deficiency is night blindness which may develop into the more serious condition xerophthalmia. Vitamin A also participates in the formation and maintenance of the integrity of epithelial tissues and mucous membranes. Deficiency may cause skin changes resulting in a dry rough skin with lowered resistance to minor skin infections. Deficiency of Vitamin A, usually accompanied by protein-energy malnutrition, is linked with a frequency of infection and with defective immunological defence mechanisms.

Vitamin D

Vitamin D is required for the absorption of calcium and phosphate from the gastro-intestinal tract and for their transport. Its involvement in the control of calcium metabolism and hence the normal calcification of bones is well documented. Deficiency of Vitamin D in children may result in the development of rickets.

Vitamin B1 (Thiamine)

Thiamine (as the coenzyme, thiamine pyrophosphate) is associated with carbohydrate metabolism. Thiamine pyrophosphate also acts as a co-enzyme in the direct oxidative pathway of glucose metabolism. In thiamine deficiency, pyruvic and lactic acids accumulate in the tissues. The pyruvate ion is involved in the biosynthesis of acetylcholine via its conversion to acetyl co-enzyme A through a thiamine-dependent process. In thiamine deficiency, therefore, there are effects on the central nervous system due either to the effect on acetylcholine synthesis or to the lactate and pyruvate accumulation. Deficiency of thiamine results in fatigue, anorexia, gastro-intestinal disturbances, tachycardia, irritability and neurological symptoms. Gross deficiency of thiamine (and other Vitamin B group factors) leads to the condition beri-beri.

Vitamin B2 (Riboflavine)

Riboflavine is phosphorylated to flavine mononucleotide and flavine adenine dinucleotide which act as co-enzymes in the respiratory chain and in oxidative phosphorylation. Riboflavine deficiency presents with ocular symptoms, as well as lesions on the lips and at angles of the mouth.

Vitamin B6 (Pyridoxine)

Pyridoxine, once absorbed, is rapidly converted to the co-enzymes pyridoxal phosphate and pyridoxamine phosphate which play an essential role in protein metabolism. Convulsions and hypochromic anaemia have occurred in infants deficient in pyridoxine.

Vitamin B12 (Cyanocobalamin)

Vitamin B12 is present in the body mainly as methylcobalamin and as adenosylcobalamin and hydroxocobalamin. These act as co-enzymes in the trans methylation of homocysteine to methionine; in the isomerisation of methylmalonyl co-enzyme to succinyl co-enzyme and with folate in several metabolic pathways respectively. Deficiency of Vitamin B12 interferes with haemopoiesis and produces megaloblastic anaemia.

Vitamin C (Ascorbic Acid)

Vitamin C cannot be synthesised by man therefore a dietary source is necessary. It acts as a cofactor in numerous biological processes including the hydroxylation of proline to hydroxyproline. In deficiency, the formation of collagen is, therefore, impaired. Ascorbic acid is important in the hydroxylation of dopamine to noradrenaline and in hydroxylations occurring in steroid synthesis in the adrenals. It is a reducing agent in tyrosine metabolism and by acting as an electron donor in the conversion of folic acid to tetrahydrofolic acid is indirectly involved in the synthesis of purine and thymine. Vitamin C is also necessary for the incorporation of iron into ferritin. Vitamin C increases the phagocytic function of leucocytes; it possesses anti-inflammatory activity and it promotes wound healing. Deficiency can produce scurvy. Features include swollen inflamed gums, petechial haemorrhages and subcutaneous bruising. The deficiency of collagen leads to development of thin watery ground substances in which blood vessels are insecurely fixed and readily ruptured. The supportive components of bone and cartilage are also deficient causing bones to fracture easily and teeth to become loose. Anaemia commonly occurs probably due to Vitamin C's role in iron metabolism.

Vitamin E

Vitamin E deficiency has been linked to disorders such as cystic fibrosis where fat absorption is impaired. It is essential for the normal function of the muscular system and the blood.

Nicotinamide

The biochemical functions of nicotinamide as NAD and NADP (nicotinamide adenine dinucleotide phosphate) include the degradation and synthesis of fatty acids, carbohydrates and amino acids as well as hydrogen transfer. Deficiency produces pellagra and mental neurological changes.

Vitamin H (d-Biotin)

Biotin is a co-enzyme for carboxylation during the metabolism of proteins and carbohydrates.

Selenium

Selenium is an essential trace element, deficiency of which has been reported in man. It is thought to be involved in the functioning of membranes and the synthesis of amino acids. Deficiency of selenium in the diet of experimental animals produces fatty liver followed by necrosis.

Iron

Iron, as a constituent of haemoglobin, plays an essential role in oxygen transport. It is also present in the muscle protein myoglobin and in the liver. Deficiency of iron leads to anaemia.

Zinc (Zinc Gluconate)

Zinc is a constituent of many enzymes and is, therefore, essential to the body. It is present with insulin in the pancreas. It plays a role in DNA synthesis and cell division. Reported effects of deficiency include delayed puberty and hypogonadal dwarfism.

5.2 Pharmacokinetic properties

The following account describes the absorption and fate of each of the active constituents of Jessy Hemoglobin Plus Syrup.

Vitamin A

Except when liver function is impaired, Vitamin A is readily absorbed. β-carotene is Provitamin A and is the biological precursor to Vitamin A. It is converted to Vitamin A (Retinol) in the liver; retinol is emulsified by bile salts and phospholipids and absorbed in a micellar form. Part is conjugated with glucuronic acid in the kidney and part is metabolised in the liver and kidney, leaving 30 to 50% of the dose for storage in the liver. It is bound to a globulin in the blood. Metabolites of Vitamin A are excreted in the faeces and the urine.

Vitamin D

The metabolism of ergocalciferol is similar to that of cholecalciferol. Cholecalciferol is absorbed from the gastro-intestinal tract into the circulation. In the liver, it is hydroxylated to 25-hydroxycholecalciferol, is subject to entero-hepatic circulation and is further hydroxylated to 1,25-dihydroxycholecalciferol in the renal tubule cells. Vitamin D metabolites are bound to specific plasma proteins.

Vitamin B1 (Thiamine)

Thiamine is absorbed from the gastro-intestinal tract and is widely distributed to most body tissues. Amounts in excess of the body's requirements are not stored but excreted in the urine as unchanged thiamine or its metabolites.

Vitamin B2 (Riboflavine)

Riboflavine is absorbed from the gastro-intestinal tract and in the circulation is bound to plasma proteins. It is widely distributed. Little is stored and excess amounts are excreted in the urine. In the body riboflavine is converted to flavine mononucleotide (FMN) and then to flavine adenine dinucleotide (FAD).

Vitamin B6 (Pyridoxine)

Pyridoxine is absorbed from the gastro-intestinal tract and converted to the active pyridoxal phosphate which is bound to plasma proteins. It is excreted in the urine as 4-pyridoxic acid.

Vitamin B12 (Cyanocobalamin)

Cyanocobalamin is absorbed from the gastro-intestinal tract and is extensively bound to specific plasma proteins. A study with labelled Vitamin B12 showed it was quickly taken up by the intestinal mucosa and held there for 2 - 3 hours. Peak concentrations in the blood and tissues did not occur until 8 - 12 hours after dosage with maximum concentrations in the liver within 24 hours. Cobalamins are stored in the liver, excreted in the bile and undergo enterohepatic recycling. Part of a dose is excreted in the urine, most of it in the first eight hours.

Vitamin C (Ascorbic Acid)

Ascorbic acid is readily absorbed from the gastro-intestinal tract and is widely distributed in the body tissues. Ascorbic acid in excess of the body's needs is rapidly eliminated in the urine and this elimination is usually accompanied by a mild diuresis.

Vitamin E

Vitamin E is absorbed from the gastro-intestinal tract. Most appears in the lymph and is then widely distributed to all tissues. Most of a dose is slowly excreted in the bile and the remainder is eliminated in the urine as glucuronides of tocopheronic acid or other metabolites.

Nicotinamide (Nicotinic Acid Amide)

Nicotinic acid is absorbed from the gastro-intestinal tract, is widely distributed in the body tissues and has a short half-life.

Vitamin H (d-Biotin)

Following absorption, biotin is stored in the liver, kidney and pancreas.

Selenium

Although it has been established that selenium is essential to human life, very little information is available on its function and metabolism.

Ferric Ammonium Citrate (Iron)

Iron is absorbed chiefly in the duodenum and jejunum. Absorption is aided by the acid secretion of the stomach and if the iron is in the ferrous state as in ferrous fumarate. In conditions of iron deficiency, absorption is increased and, conversely, it is decreased in iron overload. Iron is stored as ferritin.

5.3 Preclinical safety data

Toxicology Iron:

Iron is a general cellular poison and is directly corrosive to the GI mucosa.

Cellular toxicity

The absorption of excessive quantities of ingested iron results in systemic iron toxicity. Severe overdose causes impaired oxidative phosphorylation and mitochondrial dysfunction, which can result in cellular death. The liver is one of the organs most affected by iron toxicity, but other organs such as the heart, kidneys, lungs, and the hematologic systems also may be impaired.

Mild To Moderate Poisoning: Vomiting and diarrhea may occur within 6 hours of ingestion.

Severe Poisoning: Severe vomiting and diarrhea, lethargy, metabolic acidosis, shock, GI hemorrhage, coma, seizures, hepatotoxicity, and late onset GI strictures.

Mutagenicity

There is insufficient information to determine the mutagenic potential of the active ingredients.

However very large doses of vitamin C are claimed to be mutagenic.

Carcinogenicity

There is insufficient information to determine the carcinogenic potential of the active ingredients.

Teratogenicity

High doses of vitamin D are known to be teratogenic in experimental animals, but direct evidence for

this is lacking in humans. The teratogenicity of vitamin A in animals is well known, both high and low levels of the vitamin result in defects. But the significance of this for humans is in dispute. Synthetic versions of vitamin A (Isotretinoin and Etretinate) have been shown to be powerful teratogens. There is insufficient information to determine the teratogenic potential of the other active ingredients.

Fertility

Not appropriate.

Alcohol:

Even though alcohol contributed to severe toxicity, Jessy Hemoglobin Syrup contains very low level of alcohol i.e. may not lead to toxicity even during pregnancy. As the National Institute of Health and Clinical Trial Excellence (NICE) recommends that women should avoid alcohol during the 1st

trimester, women who chose to drink alcohol are advised to drink no more than 1 – 2 UK units of alcohol once or twice a week. They further state that, "Although there is uncertainty regarding a safe level of alcohol consumption in pregnancy, at this low level there is no evidence of harm to the unborn baby".

6. Pharmaceutical particulars

6.1 List of excipients

Xanthan gum
Ethanol
Methyl paraben
Propyl paraben
Sodium benzoate
Chocolate flavour

6.2 Incompatibilities

Not applicable

6.3 Shelf life

Unopened: 2 years

After opening: 6 months

6.4 Special precautions for storage

Store below 30°C.

Do not refrigerate or freeze.

6.5 Nature and contents of container

200ml amber-coloured Glass bottles with 28mm plastic caps

6.6 Special precautions for disposal and other handling

No special requirements

7. Marketing authorisation holder

Jessy Pharmaceutical company Limited

13B Acme Road Ogbaegbe Industrial Estate Ikeja Lagos