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(CASE REPORT)

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Novel treatment of Paroxysmal Nocturnal Haemoglobinuria with wheat grass oral therapy

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Abstract

I will start with William Osler's Famous Quote "Always notice unusual, Publish it, Place it on Permanent Record". This has really motivated me to publish the present case report.

A 28 year old lady was diagnosed with Paroxysmal Nocturnal Haemoglobinuria at the age of 28 years. She initiated on wheat grass juice on her own after three years of diagnosis and is continuing since. She is presently 58 years of age, leading a fruitful life and her latest report shows remission of gene.

I will close by Dr Dean Ornish's(an American Doctor) remarks that if special type of diet is taken honestly religiously, it gets incorporated in DNA of individual, thus changing DNA, This has happened probably in our case.

Keywords: PNH (Paroxysmal nocturnal Haemoglobinuria; FCM (Flowcytometry); PGI CHD (Postgraduate institute of medical education and Research, Chandigarh); AIIMS (All India Institute of Medical Sciences; Pt (Patient); BM (Bone marrow); BMT (Bone marrow transplantation); DVT (Deep vein thrombosis); MAB(Monoclonal antibody) EVM (Eye, Verbal, Motor)

1. Introduction

PNH is a rare blood disorder with incidence of 2-5 per million population[1]. It is characterized by chronic haemolytic anaemia, intermittent haemoglobinuria and thrombosis with complement mediated lysis of RBC's that reduces life span of red cells from normal of 120 days to as short as 10-15 days, with most cells being functionally abnormal. The treatment is a challenge with medical drugs, steroids and bone marrow transplantation.

Wheat grass therapy has been found to be successful in some carcinomas, hemolytic anemias and thallaessemias. However, it has not been reported for treatment of PNH.

We describe one such patient of PNH diagnosed at the age of 28 years who initiated wheat grass therapy at the age of 32 years and is presently 58 years of age with no gene sequelae of PNH.

2. Case Report

A young educated female, 28 years of age and weight of 58 kg , resident of north India from Amritsar Punjab got married in July 1992. During pregnancy in 1993, in antenatal clinic in second trimester, she was found to have hemoglobin of 7.2 gm% which persisted during whole antenatal period inspite of oral and injectable iron therapy. Patient was diagnosed

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to have resistant anaemia. During last trimester she developed preeclampsia with a blood pressure of 200/160mm of Hg and underwent LSCS wherein two units of whole blood were transfused. Patient delivered a healthy male baby of 2kgs. On ninth postoperative day, while admitted in the hospital, patient complained of severe headache and was unresponsive with EMV status. On MRI subacute subdural haematoma in right frontoparietal region was seen for which emergency right FP craniotomy was performed and 100 ml of blood was drained. Patient regained EMV at end of the month. A total of seven whole blood transfusions were given, increasing haemoglobin to 10.2 gm %. Patient was discharged at end of one month.

After six months of discharge, while playing badminton at her home patient again complained of severe headache after which frequency of headaches increased. There was complaint of sleepiness in evening and passing of cola coloured urine the next day. In the next few weeks, there were numerous visits to different hospitals where differential diagnosis of porphyria and tension headaches was made. However no final diagnosis was confirmed for next 2 ½ yrs. During this period, she was prescribed oral steroids for three months and anabolic steroids for two months which resulted in no improvement and thus were stopped. At a tertiary care hospital of India, patient was finally diagnosed to have PNH after ham acid and sucrase lysis test came positive. (at that time there was no test of FCM (Flowcytometry) available). This was confirmed in another tertiary care hospital of another city. Patient was prescribed oral folic acid 5 mg twice a day due to picture of megaloblastic anaemia in bone marrow biopsy and advice of keeping herself saturated with water continuously was advised. Bone marrow biopsy done on 17/10/95 (Fig 1) . After this FCM (Flow cytometry was done (Fig 2)

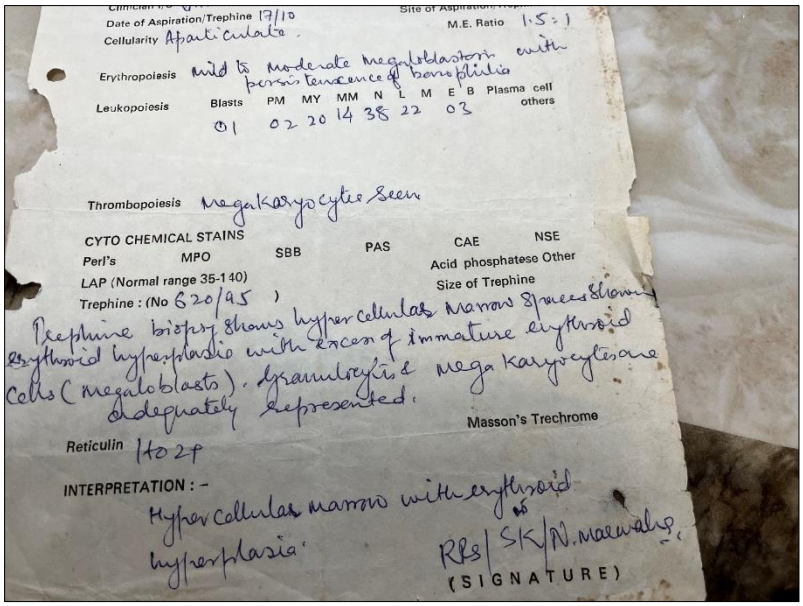

Figure 1 Bone Marrow Biopsy Report

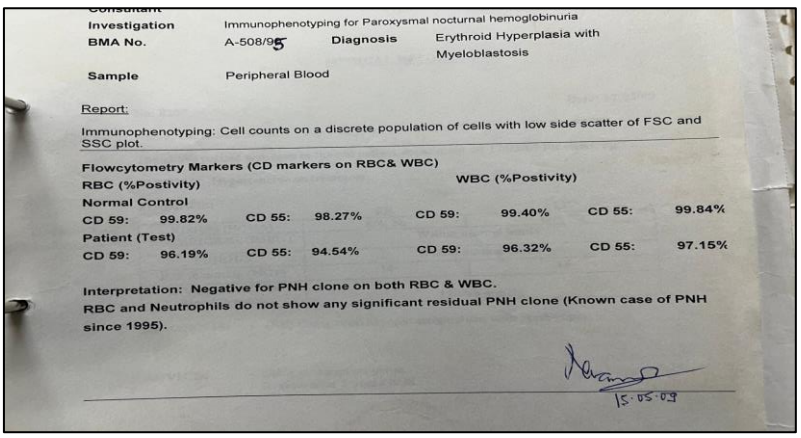

Figure 2 FCM (Flow Cytometry)

This treatment was continued with constant monitoring of haemoglobin. After three years of diagnosis patient developed right lung pneumonia for which she was hospitalised for 11 days. While admitted here, a fellow patient spoke about wheat grass therapy. Patient was inquisitive and started the therapy of wheat grass juice on her own. Initially she took half cup and then to about 1-2 glasses per day. She has continued this treatment for 9-11 yrs continuously and consistently, like she could miss her meals but never miss it, almost consuming everyday. After that intermittently for another 10 yrs and after which and till now on wheat grass tablets 500mg once a day. Also patient is on tablet folic acid 5 mg once a day with oral tablets of wheat grass 500mg once a day. She has been living a normal life and has successfully completed her post graduate degree. She suffered dengue in 2019 and recovered with conservative therapy.

Patient has Not received any bone marrow transplantation or any type of MAB (monoclonal antibody) (Ecluzimab) type of therapy in her life time.

3. Discussion

Despite its rarity PNH is a concern for haematologists as it is the only haemolytic anaemia which has acquired genetic defect. This uncommon disorder is characterised by chronic haemolytic anaemia, commonly intravascular in nature, intermittent haemoglobinuria and thrombosis [2]. The haemolysis is paroxysmal i.e. episodic and nocturnal. There is complement mediated lysis of RBC's that reduces life span of red cells from normal of 120 days to as short as 10-15 days[3], and that also which are functionally abnormal.Basic abnormality is is acquired defect of red cell membrane resulting from acquired mutation in PIGA (phosphatidylinositol glycan complimentation group A gene), an enzyme responsible for synthesis of some membrane associated complement regulatory proteins, CD55 and CD99, which makes red cells susceptible for lysis by complement of normal serum[4]. Thrombosis is major cause of death in PNH individuals with as much as 40% cases having DVT[5]. Arterial thrombosis also increased in PNH, commonly involving cerebral and coronary arteries and can be 1st manifestation of stroke in say 50% of pateints [6]. Rarely PNH can develop into pancytopenia, AA (Aplastic anaemia) [7,8]. 5-10% cases develop acute myeloid leukaemia [9] or MDS (myelodysplastic syndrome[10].

Chronic haemolysis in PNH is episodic, intermittent (Paroxysmal) and Nocturnal (sleep induced). The tendency of red cells to lyse at night is explainable by slight decrease in blood pH during sleep which increases the activity of complement, leading to intravascular hemolysis, resulting in anaemia, which can be moderate to severe. Loss of heme iron in urine causing hemosiderinuria, making color of urine coca cola itself. This was present in our patient also. In literature it is mentioned that minimum time taken for diagnosis of PNH is 2 1/2yrs as was exactly in our patient as well [11,12]. Bone marrow diagnosis (aspirate and biopsy) is reported[13].

Figure 3 chlorophyll (green pigment) (Stored in chloroplasts)

Main stay of treatment of PNH is steroids and oral danazol[14]. New emerging are monoclonal Antibody, Ecluzimab[15,16,17]. Complement inhibitor drug therapy as a novel treatment documented by Mastello DC et al [18]. Presently bone marrow transplantation is has shown encouraging results [19] Alternative ayurvedic treatment has also shown beneficial effects in some PNH patients[20] Bagwe SM et al has also reported Herbal approach of treatment in pancytopenia related to PNH[21].

Wheat grass is freshly sprouted shoot of wheat plant (Triticum aestivum), is native to Asia and mediterranian but grown worldwide. Wheat grass contains large amount of chlorophyll [22]. High chorophyll diets are helpful in treating certain

diseases like cancers, and in plants this green pigment (Fig 3) is utilised in photosynthesis (Fig 4). Cholorophyll (Fig 6) is structurally similar to Haemoglobin(Fig 5) and is said to provide increased oxygen concentration to cells which is proposed to kill cancer cells which are vulnerable to high oxygen[23].

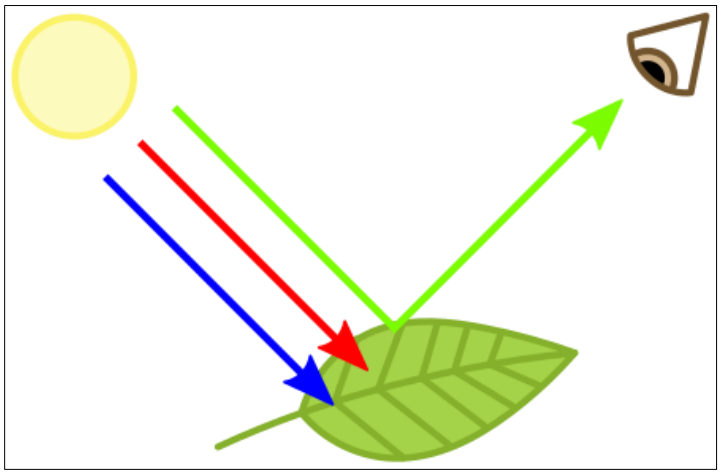

Figure 4 BLUE and RED CLOUR ABSORBED and green colour reflected Hence CHLOROPHYLL is Green colour

Figure 5 Haemoglobin structure

Another mechanism proposed is that wheat grass has high content of antioxidants, cytochrome oxidase, and superoxide dismutase and Abscisic acid which neutralises effect of gonadotrophins and similar compounds which are synthesized by cancer cells[24]. Alkaline Ph of wheat grass has anticancer properties. Wheat grass has property to alter physiological function of cells, hence act as anticancer agent[25]. Blood building capacity of wheat grass has been studied in Anaemia[26] and thallaessemias[27]. Anticancer properties of what grass was studied on Hela cell lines[28].

In haematological illnesses, the proposed mechanism is that wheat grass has structure similar to Haemoglobin ring(porphyrin ring) with difference of only of Mg++ in centre instead of iron Fe++ in hemoglobin. Wheat grass is said to be Green blood. Role of wheat grass is well documented in Anemias[26], Pancytopenia, and in Thallaesaemia[27]. However, its role has not been explored in PNH earlier.

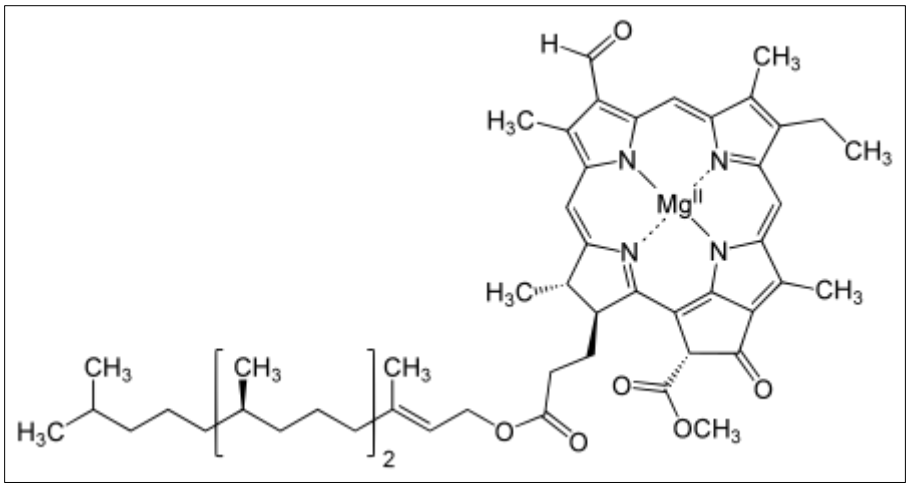

Figure 6 Chlorophyll Structure

Reported patient started consuming wheat grass as juice in small amount and gradually increased. She grew wheat grass in her kitchen garden, then after 21yrs switched to wheat grass tablet. Patient has achieved near normal life now being 58 yrs. Wheat grass has no reported side effects.

- The latest report of patient has revealed a No clone detected by flowcytometry. FIGURE 2.
- To best of our knowledge, this is the first reported case of reversal of PNH with wheat grass therapy for last 30 years.
- Management of PNH is still a challenge with new opportunities to treat with some botanical drugs[29].

4. Conclusion

As Haemoglobin & cholorophyll have identical structure with difference of iron/magnesium in centre of porphyrin ring, wheat grass is rightly said to be Green blood, when consumed orally it becomes blood & patient has consumed for 9-11yrs, & curing problem. So such like patients of PNH can get benefit from simplified therapy of Wheat grass to be taken orally, This concept really motivated me to Publish this case. Further this will open new vistas for Researchers as well as patients of PNH for still better therapies so that in real sense patients are benefitted, as there is always scope for improvement.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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