



ERYTHROPOIETIC PROTOPORPHYRIA

What are the aims of this leaflet?

This leaflet has been written to help you understand more about erythropoietic protoporphyria (EPP). It tells you what it is, what causes it, what can be done about it and where you can find out more about it.

What is erythropoietic protoporphyria?

The word 'erythropoietic' means associated with red blood cells ('erythro-') and their formation ('-poietic'). The porphyrias are a group of uncommon diseases caused by something going wrong with the production of chemicals known as porphyrins. These chemicals are the building blocks of haem, which, when combined with a protein (globin), forms haemoglobin, the material in red blood cells that carries oxygen round the body. In the case of EPP, there is a build up of one of these porphyrins (protoporphyrin) in the blood, especially in the red blood cells. This leads to a sensitivity to sunlight.

What causes EPP?

An enzyme is a protein that helps to convert one chemical substance into another. In EPP, there is a shortage of one particular enzyme (ferrochelatase), which normally helps to convert protoporphyrin into haem by adding iron to it. As a result of this enzyme deficiency, protoporphyrin levels build up in the blood. As blood passes through the skin, the protoporphyrin absorbs the energy from sunlight and this sets off a chemical reaction that can slightly damage surrounding tissues. The nerve endings in the skin interpret this as

itching or burning pain, and if the blood vessels are affected, they can leak fluid, causing swelling.

The light that protoporphyrin absorbs is different from that which causes ordinary sunburn. Usually sunburn is caused by the shorter wavelengths of ultraviolet light (UVB), but in EPP the skin is more sensitive to longer ultraviolet wavelengths (UVA) and to visible light.

Is EPP hereditary?

Yes, but there is not always a family history of the condition. Everyone has two genes for ferrochelatase in each cell in their body (one coming from their mother and one from their father). In most families, EPP occurs when an affected individual inherits a gene for a severely underactive ferrochelatase enzyme from one parent, and a less severely affected gene from the other parent. The less severely affected gene is quite common, being present in about 10% of the general population, but it never causes EPP by itself. The genetics is quite complex and advice from your local genetics service may be useful.

What are the symptoms of EPP?

Typically EPP starts with abnormal sensitivity to sunlight. Exposure to sunlight causes tingling, itching or burning, which may be associated with redness and swelling. These symptoms usually occur within a few minutes of skin exposure to sunlight, and often they take hours or days to resolve. During this time the skin may feel more sensitive than usual to extremes of temperature. The light producing these changes need not be direct – light reflected off water and sand, or passing through window glass, including car windscreens, can also cause the symptoms.

EPP usually starts in childhood, and affects males and females equally. Infants may cry or scream after being taken out into the sunlight; and older children may complain of burning and try to wave their hands in the air, or put them into cold water to try to relieve the pain. A very small number of people who have

had with EPP for many years may develop liver damage. Fortunately this is rare.

What does EPP look like?

Despite severe discomfort, there may be nothing abnormal to see on the skin. Sometimes there can be swelling of the skin, initially like a nettle rash. With time, some people develop thickening of the skin over their knuckles, and small scars on sun-exposed skin such as that on the cheeks, nose, and backs of the hands. However these skin changes show wide variation between different individuals.

How is EPP diagnosed?

The diagnosis is usually suspected from the story, and can be confirmed by a blood test. This measures the amount of protoporphyrin in the blood (serum protoporphyrin) and in the red blood cells (erythrocyte free protoporphyrin). Some doctors will also ask for a stool sample to measure the level of protoporphyrin in the faeces. No urine tests are relevant to this condition except to exclude other types of porphyria.

Although it is unlikely that you will develop liver problems as a complication of EPP, your doctor may monitor the way your liver is working by yearly blood tests. If there is any evidence of a deterioration in liver function, there are certain interventions that may help to halt or reverse this.

As EPP affects the production of haemoglobin, it is not uncommon for people with EPP to be slightly anaemic. Your doctor will probably also measure your blood count to make sure that you are not becoming too anaemic.

Can EPP be cured?

At present there is no cure for EPP.

How can EPP be treated?

The aim of most treatments is to give your skin extra protection from sunlight, so that you tolerate sunlight better. Advice about clothing and sunscreens is given later in this leaflet.

Medical treatments for EPP include the use of:

- **Beta-carotene.** This is derived from the chemical that makes carrots orange. Some people with EPP find that taking beta-carotene capsules is helpful. The capsules are available on prescription (supplier details are given at the end of the sheet), are taken by mouth, and usually give the skin a slightly orange colour. This medicine is considered to be safe, but may occasionally cause a slight tummy upset. Large studies showed some health gains eg fewer strokes but also increased risk of lung cancer in smokers.
- **Antihistamines.** These tablets or syrups may help the few people for whom the nettle rash response of the skin is a major problem.
- **Phototherapy.** Narrow-band UVB and PUVA therapy are types of ultraviolet light treatment used in dermatology departments. They involve careful exposure to artificial ultraviolet light, usually three times a week for about five weeks in the spring, to allow the skin to thicken slightly and develop a tan. This acts as a natural sun block and may improve tolerance to sun exposure over the summer.
- Treatments still being developed include the possible use of L-acetyl cysteine, MSH (Melanotan), and dihydroxyacetone paint.

What can I do?

It is sensible to avoid unnecessary exposure to sunlight. Other helpful measures include the wearing of protective clothing and the use of sunscreens:

- **Clothing** – simple measures include the wearing of clothes made from tightly woven cloth, long sleeves, a hat (ideally brimmed or Foreign Legion-style); shoes rather than sandals, and gloves, particularly for driving.

- **Sunscreens** - as EPP is characterised by sensitivity mainly to visible light, conventional sunscreens that are formulated to protect against ultraviolet (particularly UVB) are usually not effective. Reflectant sunscreens that are based on titanium dioxide or zinc oxide will be more effective as they cover both UVA, UVB, and visible light to a degree. In the UK, the SPF (sun protection factor) number tells you how effective the sunscreen is for UVB, and the star rating (usually found on the back of the bottle, with a maximum 4 stars) gives a measure of the UVA protection. Examples of reflectant sunscreen products available on prescription and from chemists include:

Ambre Solaire® lotion SPF 60 Delph® lotion SPF25

Sunsense® Ultra SPF 60

Delph® lotion SPF 30

E45 Sun® lotion SPF25

Ultrablock® cream SPF30

E45 Sun® lotion SPF50

Vichy factor 60A

A tinted reflectant sunscreen is available on prescription from Dundee Pharmaceuticals in three colours: coral pink, beige, and coffee. These can be mixed to obtain a good colour match with your skin (Dundee Pharmaceuticals, Ninewells Hospital, Dundee. DD1 9SY, telephone: 01382 632052).

- **Reactions to other medications.** Unlike other types of porphyria, EPP does not cause porphyria 'crises' as an effect of certain medicines and anaesthetics. Some doctors and pharmacists confuse EPP with these other porphyrias and may tell you to avoid certain medicines. In general you can take whatever medicines your health requires.

Where can I get more information about EPP?

As EPP is so uncommon, many general practitioners will have had little experience of dealing with it. However, dermatologists see most people with EPP, but if they too have little personal experience of the problem, they may refer you to a colleague with particular expertise, for investigations and discussion. If you are concerned about the likelihood of passing the condition

onto your children, you may be referred to a geneticist for information about this complex area. There are a number of other sources of information, most of which are on the Internet. Most give details about all forms of porphyria, although a few specialise just in EPP.

1. Organisations specialising in EPP.

Netherlands EPP Foundation – click the Union Jack flag to translate

www.epp.info

EPPREF

www.brighamandwomens.org/eppref

National Centre for Biotechnology Information - OMIM

www.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=177000

Pubmed – search for medical journal articles

www.ncbi.nlm.nih.gov/entrez/query.fcgi

EPP information, links and results from recent research

<http://Alzuko.tripod.com/epp.htm>

2. Organisations dealing with all forms of porphyria

British Porphyria Association

14 Mullison Rise, Gravesend, Kent, DA1Z 4QJ Tel: 01474 369 231

www.porphyrria.org.uk

European Porphyria Initiative

www.porphyrria-europe.com

Canadian Porphyria Foundation CPF

Box 1206, CA-Neepawa, R0J 1H0 Phone/Fax: Country code, then 204 476 2800

www.cpf-inc.ca

American Porphyria Foundation

P.O.Box 22712 US-Houston, TX 77227 USA

University of Cape Town Porphyria Service, South Africa

<http://web.uct.ac.za/depts/porphyria/>

University of Queensland, Australia

www.uq.edu.au/porphyria/

CLIMB – children living with inherited metabolic diseases

176, Nantwich Road, Crewe. CW2 6BG Telephone: 0870 7700 326

www.climb.org.uk

3. Other information:

Beta-Carotene - sources and dosage:

Beta-carotene is available on prescription, and the dosage required may be up to 200mg per day. In the UK, the only licensed preparation is a 3mg capsule. Higher strength preparations are available via a company called IDIS, which imports them from abroad. As these preparations do not have a product licence in the UK, IDIS requires written confirmation from your consultant of the reason why these higher strength capsules are required. This is to satisfy the Medicines Control Agency that there is a need to import the product even though a licensed product is available in the UK. The contact details for IDIS can be found on their website: www.idisonline.com.

Window film to cut out UV / to cover operating theatre lights:

Bonwyke Window Films Ltd., 41-43 Redlands Lane, Fareham, Hampshire.
PO14 1HL Telephone: 01329 289621

Madico (Madico CLS200XR) 45 Industrial Parkway, Woburn, MA 01888, USA.
Telephone: 001 800 225 1926. Email: info@madico.com

(Whilst every effort has been made to ensure that the information given in this leaflet is accurate, not every treatment will be suitable or effective for every person. Your own doctor will be able to advise in greater detail.)

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