

Women beautify yourselves: Dye hair, apply henna but at the same time watch your kidneys

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Every woman has a right to change her outlook, use different types of hair colours or tattoo themselves with henna; some have a passion for it while others use it at times of need. The history of cosmetics has a span of more than 7,000 years and is present in almost every society. The Nefertiti bust in Cairo Museum which dates back to 1320 BC clearly reveals the use of eyeliner, and Cleopatra, the last female pharaoh of Egypt was also famous for eye make-up and death by its poison.

Paraphenylenediamine (PPD), an aromatic compound is a white crystalline material which turns black when exposed to moisture, so is called the "kala pathar" in common day language. This substance in industries is used for dyeing fur, making dark coloured cosmetics, added in henna for fortifying purposes, and for photocopying, printing inks etc. In Pakistan it is easily available in very small grocery shops even in villages at a very low cost, and is therefore easily accessible to the common people.¹ The concentration of PPD varies from 2-10% in branded dyes to 70-90% in dyes directly prepared from stone.² Reported lethal dose is 7-10 Grams.³ Its most common use is for dyeing hair. As a hair dye, PPD can be applied directly by dissolving it in water or it can be mixed with henna or henna mixed with PPD is applied to the skin to get quick and desirable skin colour. First case of PPD poisoning was reported in 1924.⁴ PPD can cause severe toxicity, anaphylactic reaction, acute laryngeal oedema, acute hepatic injury, acute myocardial dysfunction and acute kidney injury. Several studies have been published on one or other deleterious effects of this poison.⁵⁻⁹ The first study specific to renal involvement with PPD poisoning was published from India.¹⁰

Symptoms vary according to dose of ingested material. Person ingesting PPD orally develops massive swelling of face and neck within minutes, followed by difficulty in breathing and swallowing, brownish to blackish vomiting (may or may not be present), initially cola colored urine then decline in urine output. Otolaryngeal examination



Figure: "Kala Pathar", it was crystalline white but during the process of photography in the humid air of Karachi, turned black at places. It costs PKR 50 and weighs 23.5 Gm.

reveals angio-oedema of the tongue, pharynx and epiglottis. Patients require emergency tracheostomy to preserve airway in majority of cases. According to a published report from Rahim Yar Khan most common cause of emergency tracheostomy was PPD poisoning.²

Many articles have been published from Pakistan reporting 1-1032 cases of PPD poisoning.^{1,6-9} The largest number was reported from medical university hospital of Nawabshah, which caters to patients from three different districts (Naushehro Feroze, Sanghar and Nawabshah). The most common reason for ingestion of the substance was suicidal attempt/ self harm, with few exposures resulting accidentally and still lesser were homicidal, or those where intention was homicidal and were not brought to hospital. The reported time to reach a medical facility varies from one to 24 hours. Number of people harmed with this poison must be much higher as those who ingested very high dose or developed acute myocardial depression or severe respiratory distress or were given the poisonous drug with homicidal intentions could not be estimated as they never reached a hospital. Females are affected more than males ranging from 56 to 78% of total studied population.^{1,6,7}

The Sind Institute of Urology and Transplantation, a tertiary renal care unit located in Karachi, has faced the hazards of PPD in the form of acute renal injury (AKI) over

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the last more than a decade. The first reported case at this institution was in 2005. It was a patient with homicidal intentions, but later 92% were meant to self harm.¹ Toxic rhabdomyolysis is the most common cause of AKI, while acute intra-vascular haemolysis and/or interstitial nephritis can also contribute to renal injury. We published our experience of 100 cases of AKI resulting from PPD poisoning in 2015.¹ This has increased to 135 in 2017⁹ and we still see some cases every year though the numbers have decreased which can be due to more authoritative management at other close located medical facilities available over the years (studies published from Nawabshah and Mirpurkhas divisions), but unfortunately number of poisoning cases have not decreased. Majority of people with renal dysfunction require renal replacement therapy, which can only be addressed at renal care units. Renal recovery is good in those who timely reach at renal care units and hepatic dysfunction recovery is even better at an early pace without much specific management.

As a medical community it is our responsibility to spread word of awareness about hazards of this cheap and easily available poison. It seems that the common man is already well acquainted with PPD and even women who are totally illiterate, get access to this substance and use it for desired results. If they succeed they are never seen by the medical community. The effective approach would be to educate the health policy makers and enforce some measures to ban the sale of this substance at the door

step, in its very raw form.

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