Edward Cranch

1893 - A study of certain drugs causing cyanosis

"What, in the first place, do we mean by cyanosis? Dunglison calls it "a disease in which the surface of the body is colored blue" from patency of the *foramen ovale*, or some obstruction of circulation in the right side of the heart, but Foster gives a better definition, namely, "a bluish discoloration from defective aeration of the blood." The word is from the Greek κύανος blue; and the condition is a familiar one occurring in collapse, asphyxia, and cardiac failure. The mental state may be one of hebetude or anguish, the surface warm or cold, moist or dry, and the muscles relaxed or in spasms.

It is alarming always, but notably so when extreme cardiac and pulmonic failure occur, as in artificial anaesthesia, in advanced pneumonia, in croup, in pleurisy, and in cholera.

It is of lesser import, and causes less alarm, in ague, in congenital diseases of the heart, and in chronic asthma, because in these complaints a certain tolerance is established, and the blueness does not increase beyond a certain point. Cyanosis of the tongue is more alarming than elsewhere, because the blood vessels of the tongue are so closely related to the vascular system of the brain, especially from the under surface of the tongue, by which important information may often be secured.

Please observe that cyanosis means more than simple pallor, or a Hippocratic expression of features, it always means blueness or duskiness, in accordance with its use in the original Greek.

Now on comparing the lists in the repertories with the list of drugs known to have caused cyanosis, we find that several, put prominently forward, are not known to have caused this condition, which they have removed. This does not prove that they could not have caused it, only that observations are still lacking.

Foremost of those causing it, is aniline, whose presence may often be detected by this very symptom, as when phenacetine, antifebrin, or some of their kindred, have been administered, and yet the chemistry of the stomach has evolved the poisonous ingredient. Yet in one of the records (*Chemist and Druggist*, May 31, 1890), we find these words, "the characteristic blueness of skin was general over the whole surface, but especially dark on eyelids, chin, and temporal region." Then it says, " the general appearance was quite different from that of cyanosis." It would be interesting to hear that writer´s definition of cyanosis, if the aforesaid condition differed from it, but probably he, or she, meant to say that the collapse was not so thorough or profound as is usual in cases that exhibit that degree of cyanosis.

With the blueness of aniline poisoning is associated more or less gasping for breath, a small and irregular pulse, dullness of sense, slight or no convulsions, or contraction of limbs, sometimes vomiting and severe diarrhoea, sweating and partial collapse, with feeble voice. A peculiar symptom is anaesthesia of arch of palate, so that tickling fails to excite nausea. The urine is deep brown, and there is great weakness and loss of appetite. Sensibility is generally retained and coma is only late.

Next to aniline, in the frequency and severity of the cyanosis, is nitro-benzine, or artificial oil of bitter almonds, which produces also trismus and other tetanic symptoms, with slow respiration and unconsciousness.

Another drug is nitrite of soda, the cyanosis from which is very marked, especially about lips, with giddiness, strong beating of heart, swollen feeling of face and head, and symptoms of collapse, with nausea and vomiting.

None of the above drugs have been proven with care or interest, so far as known, and verifications are lacking, but for cyanosis as a prominent symptom, with great debility, and few other symptoms, they should be of use. The natural oil of bitter almonds causes cyanosis, with a very prominent brilliancy or glassiness of the eyes, which yet have a vacancy of expression, or a complete unconsciousness.

Hydrocyanic or prussic acid, the active principle of the above, and of several other drugs, laurocerasus, kalmia, etc., gets its name, not from its power of causing cyanosis, as it does, but from its chemical action in forming prussian blue, a ferric ferro-cyanide of potassium.

In aniline, prussic acid, copper, and baptisia, we have a group that seems to illustrate to old doctrine of signatures, or blue curing blues. It is not by reason of their blueness, however, that they cause or cure blueness, but by their depressing action on the heart, for aniline and copper form many colors beside blue, and other substances, not blue at all, will cause blueness or cyanosis.

Copper-poisoning is extremely painful and highly spasmodic, and only blue in its extreme stages, with partial or complete relaxation and unconsciousness; and baptisia causes blueness from congestion of the face and head, with fever and delirium, but rarely complete unconsciousness.

Arsenic causes cyanotic symptoms by engorgement of veins, which show, hard, full, and knotted, not totally relaxed, as from the aniline poisons.

Snake poisons, especially the bothrops, will produce cyanosis, but more often a yellowness. Bothrops causes amaurosis and day-blindness, with sciatica, haematuria, pulmonary congestions, and paralysis beginning in extremities, with capillary haemorrhages from slight causes, with refusal of blood to clot, as in crotalus. A recent case of nose-bleed, in a constitutional bleeder, was promptly and permanently controlled by crotalus 30. There was blueness under the eyes from extravasated blood and a general nervousness. Lachesis causes more a localized cyanosis, as a round ulcer, eruptions and wounds, also, blueness of the tongue.

In the action of the snake poisons, pain is not prominent, but hyperaesthesia and anaesthesia are common. Convulsions and collapse are rare, except just before death, if that occur.

Colchicum is one of the painful producers of cyanotic symptoms, and, as Dr. Lee has remarked, is closely related to the phenomena of cholera. The blueness is not very characteristic, and is mostly confined to the face - cheeks, lips and eyelids.

Carbonic oxide, found in coal-gas, and sometimes as an outsider in laughing-gas, causes blueness of the conjunctiva, noises in the ears, trismus, nausea, and anaesthesia of the skin. Heat is a good antidote, as it also is for the over-action of chloral, chloroform, and ether, which are familiar producers of cyanosis, often speedily followed by complete asphyxia and death.

Opium cyanosis is not so alarming, since it is generally noticed while the body is still very warm, and often passes off spontaneously, like the cyanosis of alcoholism.

Nux vomica and strychnia cause blueness by their tetanic action, associated with pain and generally full consciousness.

Glonoine cyanosis is preceded by pain, but rapidly followed by unconsciousness, and is most exactly allied to apoplectic coma.

Aloes produces a somewhat similar state, but with less unconsciousness.

Sulphur causes duskiness, with faintness and exhaustion, and is of service in chronic blue conditions, along with lachesis, arsenic, digitalis, cactus, tartar emetic, and others.

Digitalis has no recorded case of cyanosis caused, but a large record of cures.

Carbo vegetabilis and camphor have not often caused it, but have very often cured it, with anxiety, coldness and rigidity.

Veratrum album and nicotine may be thought of here, with a great usefulness in cholera, but, with cyanosis proper not a prominent symptom, generally only a duskiness under the eyes.

Copper is closely related to veratrum, but may be distinguished by green vomit, with copper, and stronger voice with veratrum, and more complete suppression of urine in copper.

Ailanthus belongs in dusky fevers, with great prostration, as in scarlatina, la grippe, and diphtheria.

Ranunculus bulbosus in blueness of eruptions; argentum nitricum in the blueness of malaria and diphtheria, along with baptisia and lachesis.

Bromide of potash has a mottled blue, sometimes found in apoplexy, and in "worm-spasms" of children.

Hamamelis has a passive, local blueness, not very alarming, but often characteristic, as in all forms of varicosis, where it is ably complemented by lycopodium.

Secale, phosphorus, arnica and sulphuric acid, have the blueness that belongs to ecchymosis.

Pulsatilla and crotalus are of more use in dark-colored erysipelas; veratrum viride in congestive fevers; bromium in croup - all with cyanosis.

Berberis and china have a general blueness, associated with engorgement of the portal circulation; the blueness of berberis showing more inside the lips, that of china about the sockets of the eyes.

Plumbum, when it produces blueness, has a notably dry skin, continuous pain, or else unconsciousness.

Tartar emetic, on the contrary, has profuse sweat, and is free in all secretion, unless in that of the urine.

Other remedies, of course, produce and cure cyanosis; but it is believed that these are the chief of the cyanotic group of drugs. Verifications can doubtless be furnished by all of you from your own experience."

(Edward Cranch, M.D., A study of certain drugs causing cyanosis, Transactions of the twenty-eight session of the Homoeopathic Medical Society of the State of Pennsylvania, held at Philadelphia, September 14, 15, 16, 1892; Philadelphia 1893, p. 68-74)