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DETOXIFICATION

Sam Ziff

Dorland's Medical Dictionary defines detoxification as:
"1. reduction of the toxic properties of poisons. 2. treatment designed to free an addict from his drug habit. Metabolic detoxification, reduction of the toxic properties of a substance by chemical changes induced in the body, producing a compound which is less poisonous or is more readily eliminated."

There are two other words that should be clarified at the outset, chelate and chemotherapy. Dorland's definition of these words are:

Chelate: "to combine with a metal in complexes in which the metal is part of a ring. By extension, a chemical compound in which a metallic ion is sequestered and firmly bound into a ring within the chelating molecule. Chelates are used in chemotherapeutic treatments for metal poisoning."

Chemotherapy: "the treatment of disease by chemical agents; first applied to use of chemicals that affect the causative organism unfavorably but do not harm the patient."

Nonproprietary agents that might possess the desired characteristics to fit the above three definitions, do not command any great interest within the medical community or allocation of government research funds. As a result, there is a paucity of research data on such substances. Conversely, there is quite a bit of data available on proprietary substances, replete with their potential toxic side effects.

The question of which substances will assist in the detoxification of heavy metals is one that is most frequently asked and discussed by BioProbe subscribers. The same is true in relation to queries from the general public. In an effort to satisfy some of these questions Bio-Probe has done an extensive literature search and review on the subject. We will attempt to fill the information void on non-toxic substances available for use as chelates or detoxicants.

The subject is an extremely complex one and the information we will provide will hopefully clarify some of the complexities, while at the same time providing useable data on the substances that can be used. Time and space limitations restrict the amount of information that can be included in any one issue of Bio-Probe. Consequently, we will be providing the information in installments.

To place the complexities of detoxification in perspective we will concern ourselves with the following major aspects:

1. Elimination or reduction of the source.
2. Mediating the toxic effects. This can encompass the prevention of free radical generation; the scavenging of free radicals; preventing enzymatic interference and maintaining homeostasis of essential nutrients and minerals.
3. Controlling transport, tissue distribution and inducing elimination.
4. Repletion of essential nutrients and minerals.

Although applicable to other metals used in dentistry, at this time we will only address the above aspects in relation to mercury. Elimination of the source is, of course, the ideal situation. This would encompass the replacement of amalgam fillings with composites or gold. It should also take into consideration the elimination or reduction of other available sources of mercury such as dietary, cosmetic, and OTC drug preparations. Efforts should be made to reduce or control the intake of foods or use of products or preparations containing mercury or other substances having the potential for negative interactions. There is also the potential for positive diet modification i.e. the inclusion of sulfur/thiol containing foods in the diet that have the potential of augmenting the molecular binding and elimination of mercury from the body. This philosophy should carry through during the preoperative, operative and postoperative phases of treatment and during the postoperative detoxification phase.

Mediating the toxic effects and other aspects of 2 above requires consideration of the relative time-frame of the dental treatment plan. Elapsed time from patient agreement of the proposed dental plan and the first appointment, in some instances, can extend for weeks. If there is obvious symptomatology reflecting a sensitivity to mercury vapor exposure existant at the time of acceptance of the dental plan then a tailored preoperative nutritional program could potentially serve to ameliorate symptomatology, reduce the potential of free radical pathology through control and scavenging and also assist in rebalancing of essential nutrients. In this context it is important that careful consideration be given to any possible interactions with medication the patient may be on.

Two essentially different philosophies exist in regards to preoperative protocols. One school of thought believes the primary consideration should be the enhancement and strengthening of the patient's overall health/nutritional status. The second school of thought centers around a major emphasis for the maximum reduction of mercury body burden prior to starting any treatment plan.

Protocols related to the philosophy of enhancing the nutritional status of the patient would, in all probability, also increase the elimination of mercury to some degree. The degree of elimination induced is of course a function of quantity, potency and chelating efficacy of any of the nutrients involved.

Applying the maximum body burden reduction philosophy has the potential of also offering some degree of diagnostic capability. Diagnostic chelation protocols can be used with mercury urine assays to assess the increase in "mercury dumping". This could serve as a diagnostic indicator of gross mercury body burden and, perhaps more importantly, urine mercury assays would provide evaluation data on the efficacy of the detox protocol being employed.

Both philosophies or approaches to achieving the desired goals have merit. Hopefully the information we provide in this series will permit the clinician to intelligently tailor his or her approach to best fit the patient's needs.