

Toxic chemicals in the environment



Virtually no day goes by without an alert from the media about some chemical in the environment that is suspected of harming our health. It may do this by disrupting our hormones, triggering cancer, causing heart disease, affecting brain development, or any combination of these. Among numerous other substances it might be oxybenzone in sunscreens, tetrachloroethylene residue in dry cleaned clothes, caramel colouring in cola drinks, arsenic in rice or phthalates in plastics. The allegations are generally backed up by references to the scientific literature but interpreting the data in practical terms is very challenging. It has been said that our ability to collect data has outstripped our ability to analyze what the data means.

Take endocrine disruptors for example. These are chemicals that can in some way interfere with the chemical messengers we call hormones. Such interference can cause cancer, developmental issues, learning disabilities, attention deficit disorder, obesity and reproduction problems, especially if exposure is during the critical period of development between a fertilized egg and a full formed baby. This is the time when cells multiply quickly and take on their individual characteristics. Exposure to chemicals that would be innocuous in an adult can at this point have serious consequences. It stands to reason that effort should be made to reduce exposure to endocrine disruptors particularly during pregnancy.

But here's the rub. We are awash in endocrine disruptors, both natural and synthetic. There are dozens and dozens of chemicals that when tested on cell cultures in the lab or in animals have hormone disruptive effects. Yes, there are the usual suspects like bisphenol A, phthalates and parabens, but numerous others don't get much play in the press because they occur in nature. Naringenin in oranges and grapefruit, genistein and daidzen in soy, hops in beer, nicotine in tobacco caffeine in coffee and indole in corn can all be shown to have the ability to disrupt hormonal activity. The same goes for resveratrol in red wine, as well as for ethanol which is the alcohol in alcoholic beverages. Of course the effects of all of these are dose dependent and route of exposure dependent. Inhalation, ingestion or dermal exposure can have very different effects.

I am certainly not saying that we should have no worries about chemicals to which we are exposed. We do need to be concerned about alcohol, lead, smoke, mercury, some pesticides and some flame retardants, but we also need to understand that just because some substance in a pure form causes an adverse effect in a test tube or in an animal doesn't mean that its presence in a consumer product presents a risk. There are thousands of chemical reactions going on in our body all the time including numerous ones that break down potential toxins. The human body and its interaction with chemicals is far too complex to yield simple answers.

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