# Looking into the pregnant woman's eye

*To the Editor*—I read with interest the recent article by Chung et al[1] discussing the use of ophthalmic medications during pregnancy. The authors are to be congratulated for preparing such a comprehensive, well-referenced, and timely publication on this subject. The authors, however, also indirectly reminded us of how little is known about the visual changes associated with normal, or indeed abnormal, human pregnancy. I wish to comment on pregnancy-associated ophthalmic changes.

Visual disturbances are not uncommon in otherwise healthy pregnant women.[2] Although some ocular changes associated with pregnancy may offer insight into the pathophysiology of a pregnancy-specific disorder (eg pregnancy-induced hypertension) or a non–pregnancy-specific disorder (eg glaucoma or diabetes), most visual changes in a parturient woman are of a benign nature; they warrant no ophthalmic referral and require no medical intervention.

Park et al[3] followed 24 healthy women throughout pregnancy and found an increase in the corneal curvature during the second and third trimesters. The curvature either resolved post-partum or after the cessation of breast-feeding. Weinreb et al[4] measured the corneal thickness in 89 healthy pregnant women and found an increase by about 3% in comparison with the control group of non-pregnant women. The increase was attributed to increased water retention during pregnancy (secondary to changes in the hormonal milieu).

Despite the successful use of contact lenses prior to pregnancy, some women develop contact lens intolerance during pregnancy.[1] This pregnancy-related contact lens intolerance is unlikely to be due to an increase in corneal sensitivity. Conversely, corneal sensitivity either remains unchanged or decreases in pregnancy, possibly relating to water retention.[2] The intolerance may actually be due to an increase in either corneal curvature or thickness associated with pregnancy.[3,4] These findings have led to the recommendations that pregnant women should delay fitting new contact lenses until several weeks post-partum.

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# Use of hair analysis in diagnosing heavy metal poisoning

*To the Editor*—I am writing with reference to the article by Poon et al[1] in the June 2004 issue of the *Hong Kong Medical Journal*.

The World Health Organization (WHO) stated in 1990 that fish and fish products are the dominant sources of human exposure to methylmercury.[2] After ingestion, about 95% of the ingested methylmercury is absorbed by the intestine, and distributed to all tissues within about 4 days.[3] Relative to its concentration in the blood, the concentration of methylmercury is 5 times greater in the brain, and 250 times greater in hair.[4] Once in the central nervous system, methylmercury can be demethylated to inorganic mercury, which has a long half-life, measured in years.[5] Methylmercury crosses the placenta freely and has devastating effects on the foetal brain. Effects in both adults and foetuses are dose-related, but the foetus is 5 to 10 times more sensitive.[6]

International authorities like the WHO (1990, 2003), the United States Environmental Protection Agency (USEPA) [1997], US CDC/ATSDR (1999), the European Commission (2001), and the Queensland Government Public Health Service (2002) have documented and recognised the use of hair in the monitoring of chronic dietary methylmercury exposure. The rationale is that the structure of the hair is permanent and once a heavy metal atom is incorporated into it, the atom is irrevocably fixed there. Hair concentrations of methylmercury are proportional to blood concentrations at the time the hair strands were formed.[2] Since scalp hair grows at an average speed of 1 to 2 cm per month, hair elements analysis can thus provide a temporal record of element metabolism that has occurred during the previous 1 to 10 months. Blood samples are useful primarily in cases of acute high-level exposures to mercury, but are not reliable as an indicator of total body burden in longer-term exposures.[7] Urine samples are believed to reveal mercury exposure over the previous 2 to 3 months. Mercury excretion after a dose of chelating agent reflects the body burden better than basal excretion.[6]

The USEPA and the National Academy of Sciences recommend keeping the whole blood mercury level down to lower than 5.0 μg/L or the hair mercury level to lower than 1.0 μg/g. This corresponds to a reference dose (RfD) of no greater than 0.1 μg Hg/kg body weight per day.[8] Concerning the external contamination of hair, it can be minimised by collecting samples from close to the scalp or from unexposed areas (eg pubic hair), and by properly washing the hair before analysis. In fact, the degree of contamination on the hair by commercial shampoo was found to be negligible.[9] The reliability of the test depends on the equipment, procedure, and quality control of the laboratory. It is therefore important to choose a good laboratory to conduct the mineral analysis.

As with all other laboratory assessments, however, the correlation between hair element levels and physiological disorders is determined by numerous factors, including individual sensitivity and the body's compensatory mechanisms. The data obtained should be considered in conjunction with clinical symptoms, dietary habits, occupation and lifestyle, physical examinations, and the results of other laboratory tests.

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# Authors' reply

*To the Editor*—We would like to thank Dr LYY Ko for her comments on our article.[1] Using a questionable diagnostic test in patients presenting with non-specific symptoms, as demonstrated by the three cases we reported, will produce many false-positive results. While in theory it sounds logical to consider hair analysis results in conjunction with clinical symptoms, dietary habits, occupation, etc, how in reality can one confirm the poorly characterised diagnosis of chronic low-dose heavy metal poisoning? The three reported cases showed that the hair analysis results were the main, if not the only, evidence to support the diagnosis. Yet all three cases were recommended for chelation therapy. How many more cases were diagnosed and treated in this manner?

Given the very disputable evidence, we opine that hair analysis should be considered only as an exploratory research method. It is essential to have scientific proof of its effectiveness by conducting well-designed studies that are subject to peer review and are able to withstand challenges. For such controversial issues, these experiments should be held under strict monitoring by an ethics committee. We can then achieve evidence-based practice. Before reaching this point, all such 'diagnoses' and 'treatment' should be considered as clinical trials at the experimental stage. The clinicians need to explain to the patients adequately and obtain their consent. Apparently, some local practitioners have jumped all these steps. Such practice could at best be excellent treatment without adequate proof or, at worst, unnecessary treatment for a non-existent disease based on fake diagnostic evidence.

The Hong Kong College of Paediatricians has published a position paper against the use of hair analysis for the diagnosis of mercury exposure.[2] It is prudent for the other local health authorities, such as the Hong Kong Medical Council and the Hong Kong Academy of Medicine, to look into this matter and issue guidance to the medical profession.

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