Letters to the Editor

Elevated serum globulin levels in South African type 2 diabetic patients

To the editor: We wish to report an incidental finding during screening of type 2 diabetic patients. Thirteen patients were included in a study evaluating the effectiveness of an oral hypoglycaemic agent in regulating postprandial hyperglycaemia. This was a prospective, within subject, dose-escalation study were each patient served as their own control. The inclusion criteria included normal hepatic function and was assessed with a range of liver function tests. The laboratory tests included analysis of serum globulin levels. In this investigation of 13 type 2 diabetic patients (mean age ± SD = 52 ± 11 years, minimum = 37 years, maximum = 77 years, 95% confidence interval = 46-58 years), it was observed that 12 of the 13 subjects had elevated serum globulin levels [mean ± SD = 36 ± 4 g/L, minimum = 33 g/L maximum = 45 g/L, 95 % confidence interval = 34-38 g/L], with one of the patients having a high normal value (reported value of 31 g/L-normal reference range being 20-32g/L). Fractionation of the serum globulins was not performed.

The globulins are a group of proteins consisting of α_1 (α_1-antitrypsin), α_2 (mainly α_2-macroglobulin and haptoglobin), β [β_1 (transferrin, with a contribution from low density lipoprotein) and β_2 (C_3 fraction of complement)] and γ fractions (IgG, IgA, IgM, IgE, and IgD), with each fraction consisting of a number of different proteins with differing functions which include immune system regulation and the transport of a variety of substances[1]. Serum globulin levels are increased with chronic inflammation, infection, autoimmune disease, liver disease and paraproteinaemia[1].

Raised globulin levels have been reported in studies[2, 3] that described abnormalities in serum immunoglobulin concentrations in patients with diabetes. It has been hypothesized that elements of the innate immune system, such as cytokines or the acute phase reactants that they may stimulate, may contribute to the development of obesity and type 2 diabetes mellitus [4]. Lindsay et al. [5] investigated the ability of gamma globulin levels (a nonspecific measure of the humoral immune system) to predict type 2 diabetes in 2530 individuals of the Pima Indian population. Gamma globulin levels were positively correlated among siblings ($r = 0.23$; $P < 0.0001$) and between parents and their children (mother/child: $r = 0.17$, $P < 0.0001$; father/child: $r = 0.25$, $P < 0.0001$). The gamma globulin levels also predicted increased risk of type 2 diabetes mellitus (1 SD difference in gamma globulin was associated with a 20 % higher incidence of diabetes [hazard rate ratio 1.20 {CI 1.11-1.30}; $P < 0.0001$]). The authors concluded that inflammation or infection may play a role in the pathogenesis of type 2 diabetes mellitus, since elevated globulin levels are intimately linked with infection and inflammation.

Presently, the clinical relevance of elevated globulin levels in type 2 diabetes mellitus is unclear. It is envisaged that the paucity of information on the role of globulins in type 2 diabetes mellitus will stimulate further research aimed at elucidating the possible role of globulins and sub-fractions thereof, in the development and progression of diabetes mellitus and its long term complications.

Rambiritch V, BSc (Pharm) PhD, Department of Pharmacology, University of KwaZulu-Natal
Mayet L, MBChB MMed Sc Addington Hospital, Department of Medicine, Diabetes Clinic
Naidoo P, B Pharm, Department of Pharmacology, University of KwaZulu-Natal

References

1. Bishop ML, Fody EP, Schoeff L. *Clinical Chemistry: Principles, Procedures, Correlations.* Philadelphia, Lippincot Williams and Wilkins, 2005.
2. Rodriguez-Segade S, Camina MF, Paz JM, *et al.* Abnormal serum immunoglobulin concentrations in patients with diabetes mellitus. *Clin Chem Acta* 1991; 203: 135-42.
3. Ardawi MS, Nasrat HA, Bahnassy AA. Serum immunoglobulin concentrations in diabetic patients. *Diabet Med* 1994; 11: 384-87.
4. Pickup JC, Crook MA. Is type 2 diabetes mellitus a disease of the innate immune system? *Diabetologia* 1998; 41: 1241-48.
5. Lindsay RS, Krakoff J, Hanson RL, *et al.* Gamma globulin levels predict type 2 diabetes in the Pima Indian Population. *Diabetes* 2001; 50: 1598-603.

RURAL Telemedicine IN AFRICA

To the editor: Most of health professionals in rural areas feel isolated from mentors, colleagues, and the information resources necessary to support them personally and professionally. The medical equipment at their disposal may be less up-to-date and other necessary facilities less than adequate. These conditions have made it difficult attracting and retaining health professionals in rural areas resulting in geographic and socio-economic isolation that have disenfranchised millions of people from the health care services they require.

The advent of telemedicine, which is the use of telecommunication and information technology to provide medical information and services, has brought an alternate solution to help address the problem of healthcare provider distribution. Rural telemedicine can be seen as the way to distribute the medical expertise out to remote and rural health professionals who need consults to help them manage their patients.

Rapid development in computer technology and easiness to purchase has led to more amenability to computer-based telemedicine technology and the growing use of telemedicine. There are two modes used in most of the today's telemedicine applications. The first one is called store-and-forward or asynchronous mode and is used for non-emergent situations, where the diagnosis or consultation may be made within the next 24 – 48 hours. The application of store-and-forward includes teleradiology (the sending of x-rays, CT scans, or MRI), telepathology and dermatology. The second mode is the interactive (real time) consultation or synchronous mode, which may involve two-way telephone conversation or two-way interactive videoconferencing that provides face-to-face consultation.

Telemedicine also requires the availability of quality telecommunication infrastructure. However, the advanced telecommunication infrastructure is usually unavailable or very expensive in rural areas. According to the Federal Communications Commission (FCC) telecommunication and health care advisory committee "… in most cases the telecommunication bandwidth available to urban health care providers and business is not available in rural areas. This poor quality or the lack of telecommunication infrastructure remains one of the major obstacles for introduction of telemedicine in most parts of Africa. Even though in other places telemedicine is being used, the services offered are limited due to the lack of sufficient bandwidth, especially for quality video transmission. So to make rural telemedicine a reality, there needs to be cooperation between the department of health and department of communication so as to make sure that the telecommunication infrastructure needed for telemedicine is there.

Malindi P, Walter Sisulu University
Kahn MTE, Cape Peninsula University of Technology