source of household fuel anymore. The similar trend or changing pattern was also noted in the study by Singh et al[3] in the Northern India. There is still strong need for improving the overall drug and medication dispensing services and to enhance the awareness of the lay person's ability to identify the potential hazards of improper medication storage and use. The data are clear that proper storage in terms of location and the child resistant containers definitely reduce the accidental ingestion of medication.[4,5] We are still lagging behind on these measures from the Western societies. Definitely, the availability of poison control centers is a step in the positive direction but their presence need to be publicized more effectively; therefore, they can be utilized more efficiently. It is shown that they can reduce the load on the hospitals by proper and timely advice to the parents and prevent undue panic and expenses.[6]

In conclusion, it cannot be emphasized enough that the reduction in the incidence of the childhood poisoning cannot be achieved unless the parents and the caregivers are prepared for the behavioral change in storing household products and medications safely in their appropriate containers. The key lies with the overall improvement in the education of the community as a whole.

Received 31st May 2003. Accepted for publication in final form 2nd September 2003.

From the Department of Pediatrics, King Fahd Hospital of the University, Dammam, Kingdom of Saudi-Arabia. Address correspondence and reprint requests to Dr. Aftab S. Chishti, Assistant Professor, Department of Pediatrics, King Faisal University, PO Box 40241, Dammam 31952, Kingdom of Saudi Arabia. Tel. +966 (3) 8823518. Fax. +966 (3) 8873700. E-mail: achishti@hospital.kfu.edu.sa

References

1. Al-Sekait MA. Epidemiology of accidental poisoning of children in Riyadh, Saudi-Arabia. ***Annals of Saudi Medicine*** 1990; 10: 276-278.
2. Ho L, Heng JT, Lou J. Accidental ingestions in childhood. ***Singapore Med J*** 1998; 39: 5-8.
3. Singh S, Singhi S, Sood NK, Kumar L, Walia BN. Changing pattern of childhood poisoning (1970-1989): experience of a large north Indian hospital. ***Indian Pediatr*** 1995; 32: 331-336.
4. Shannon, M. Ingestion of toxic substances by Children. ***N Engl J Med*** 2000; 342: 186-191.
5. Rogers, GB. The Safety effects of child resistant packaging for oral prescription drugs. Two decades of experience. ***JAMA*** 1996; 275: 1661-1665.
6. Lovejoy FH, Robertson WO, Woolf AD. Poison Centers, poison prevention, and the Pediatrician. ***Pediatrics*** 1994; 94: 220-224.

C-Reactive protein in diabetes mellitus and hyperlipidemia

Samir M. Khoja, *M.Med.Sci, D.Phil,*
Fahd A. Alabbassi, *BSc, MSc,*
Abuelgassim O. Abuelgassim, *BSc, PhD,*
Omar A. Al-Bar, *BSc, PhD.*

The aim of the present investigation is to measure serum C-reactive protein (CRP) in patients with diabetes mellitus and hyperlipidemia in order to find out an association between CRP and these diseases. This study was carried out on type 2 diabetic and hyperlipidemic patients attending Diabetic Care Center in Jeddah, Kingdom of Saudi Arabia (KSA) from October 2001 through to October 2002. Concentrations of serum CRP and lipids were determined in 143 male and female diabetic patients, 119 male and female hyperlipidemic patients and 95 male and female normal controls. Different parameters were measured according to standardized enzymatic assay methods. Serum CRP concentrations of diabetic and hyperlipidemic male patients were significantly increased ($p<0.001$), so did the concentrations of total cholesterol and triacylglycerol. The concentrations of serum CRP were significantly increased ($p<0.001$) in diabetic and hyperlipidemic female patients. This increase coincides with a significant increase ($p<0.001$) of total cholesterol, triacylglycerol and low density lipoprotein (LDL)-cholesterol. Positive associations were obtained between CRP concentrations and triacylglycerol, and LDL-cholesterol concentration. The present results confirm the view that the higher CRP concentration in serum could reflect the inflammatory component of the atherosclerotic process that is so prevalent among patients with diabetes and hyperlipidemia.

C-reactive protein (CRP) is a non-glycosylated polymeric protein consisting of 5 identical subunits. In recent years there has been a marked increase in interest in the relationship between CRP and the risk of cardiovascular disease. There are now numerous prospective studies which show that elevated baseline concentrations of CRP are correlated with a higher risk of future cardiovascular events.[1] C-reactive protein levels have been considered to reflect the extent of inflammatory reactions in the atherosclerotic vessels.[2] Thus, by virtue of its acute phase behavior, CRP is a marker for severity and progression of atherosclerotic processes in the vessels.[2] Although inflammation is hypothesized to play a role in the development of type 2 diabetes, clinical data addressing this issue are limited. Pradhan et al[3] indicated that a possible role for

Table 1 - Serum concentrations of C-reactive protein, total cholesterol, triacylglycerol, high density lipoprotein (HDL) cholesterol and low density lipoprotein(LDL) cholesterol in control, diabetic and hyperlipidemic males and females.

Parameters	Male			Female		
	Control (47)	Diabetic (70)	Hyperlipidemic (60)	Control (48)	Diabetic (73)	Hyperlipidemic (59)
C-Reactive protein (mg/L)	3.84 ± 0.14	5.26 ± 0.40*	5.26 ± 0.38*	3.75 ± 0.07	11.83 ± 1.06*	11.65 ± 1.17*
Total cholesterol (mmol/L)	4.40 ± 0.07	5.00 ± 0.12*	5.44 ± 0.13*	4.26 ± 0.13*	5.36 ± 0.13*	5.92 ± 0.10*
Triacylglycerol (mmol/L)	1.26 ± 0.07	2.38 ± 0.19*	2.82 ± 0.20*	1.32 ± 0.06	2.23 ± .15*	2.48 ± 0.17*
HDL-cholesterol (mmol/L)	1.03 ± 0.04	0.93 ± 0.04	0.91 ± 0.04	1.06 ± 0.04	1.10 ± 0.05	1.08 ± 0.05
LDL-cholesterol (mmol/L)	2.80 ± 0.08	3.04 ± 0.13	3.33 ± 0.14*	2.60 ± 0.08	3.28 ± 0.12*	3.66 ± 0.13*

Results are presented as means ± standard error of mean with (n) as the number of subjects
Significant differences between control and other groups are shown: *p<0.001

inflammation in diabetogenesis could be exerted through the elevated levels of CRP and interleukin-6. However, it was shown that plasma concentrations of CRP were significantly increased in type 1 diabetic patients as compared to control subjects possibly due to a chronic hepatic inflammatory response.[4] The aim of the present study is to investigate the concentration of serum CRP in subjects with type 2 diabetes mellitus and subjects with hyperlipidemia in order to find out any relationship between CRP and these diseases.

Type 2 diabetic patients and hyperlipidemic patients (30-60 years old) attending the Diabetic Care Center or Regional Laboratory, Jeddah, KSA, were recruited for the present study (October 2001 to October 2002). Healthy normal individuals of matched age were used as a control group. Venous blood samples (10 ml) were collected from subjected, who have been fasting for at least 12 hours, in plain tubes. Serum samples were separated from cells by centrifugation at 5000 g in a refrigerated centrifuge. The samples were kept in ice and analyzed on the same day of collection. The concentrations of serum CRP were measured in Behring nephlometer 100 with the use of commercially available kits supplied by Behring Diagnostics (Marburg, Germany) according to the assay method of Gill et al[5] The data presented in this study are expressed as mean ± standard error of mean and comparisons between the 2 sets of data were made by using Student's t test. The results shown in the present study were obtained from male and female type 2 diabetic patients and hyperlipidemic patients and compared with those obtained from male and female normal individuals of matched age. The serum concentrations of CRP and different lipid classes in males and females are presented in **Table 1**. C-reactive protein concentrations of diabetic and hyperlipidemic male patients were significantly increased (p<0.001) as compared with control subjects. The concentrations of total cholesterol and triacylglycerol were also increased significantly (p<0.001) in both groups. However, serum concentration of LDL-cholesterol was significantly increased (p<0.001) only in hyperlipidemic male patients, whereas the slight increase of LDL-cholesterol in the diabetic subjects was non-significant. The concentration of high density lipoprotein (HDL)-cholesterol was shown to be non-significantly different between patients and control subjects. **Table 1**, also shows that the serum concentration of CRP was significantly increased (p<0.001) in diabetic and hyperlipidemic female patients as compared with control subjects. This increase in CRP concentration is accompanied by a significant increase (p<0.001) in serum total cholesterol, triacylglycerol and LDL-cholesterol concentrations of the diabetic and hyperlipidemic female patients. The concentration of serum HDL-cholesterol in diabetic and hyperlipidemic female patients was non-significantly different from their matched control group. There is an increasing number of people suffering from type 2 diabetes mellitus in KSA and all over the world. Several diseases such as diabetes, endocrine and hepatic diseases could participate in secondary hyperlipidemia, atherosclerosis and oxidative stress. Diabetes mellitus is probably the most commonly seen disorder that can cause secondary hyperlipidemia and vascular disease as seen in diabetic patients.[6]

In the present study, we have demonstrated that serum concentrations of CRP of diabetic and hyperlipidemic patients were significantly higher in both males and females than normal controls. In fact they were increased by 37% in diabetic and hyperlipidemic males, whereas they were increased by 215% in diabetic females and 210% in hyperlipidemic females. This increase in CRP coincides a significant increase in total cholesterol, triacylglycerol and

LDL-cholesterol. These data support the reported observations that a variety of features of the metabolic syndrome are associated with a systemic inflammatory response.[7] Our results also show a positive correlation between CRP concentrations and concentrations of total cholesterol and LDL-cholesterol in diabetic and hyperlipidemic male patients (r=0.35, $p<0.05$) and female patients (r=0.42, $p<0.05$). Although there was an inverse relationship between CRP levels and HDL-cholesterol concentration in the diabetic and hyperlipidemic male patients, but this association was non-significant and could not be obtained in the female patients. However, this result of the present study contrasts the finding of Pirro et al[8] who showed that plasma CRP levels have strong negative correlation with plasma HDL-cholesterol concentration. The discrepancy between our data and the data of Pirro et al[8] is probably because our patients may produce more HDL. The present investigation also showed positive associations between CRP concentrations and body mass index or triacylglycerol concentrations (r=0.40, $p<0.01$) which is in agreement with other published data.[8] The reason for the relationship between CRP and body mass index is possibly that because individuals with obesity are at increased risk for various chronic diseases, several of which are characterized by elevated CRP concentrations. Also, because individuals with diabetes are at increased risk for cardiovascular disease, the higher CRP concentrations could also reflect, in part, the inflammatory component of the atherosclerotic process that is so prevalent among patients with diabetes.

Received 16th June 2003. Accepted for publication in final form 2nd September 2003.

From the Department of Biochemistry, King Abdul-Aziz University, Jeddah, Kingdom of Saudi Arabia. Address correspondence and reprint requests to Prof. Samir M. Khoja, PO Box 6781, Jeddah 21452, Kingdom of Saudi Arabia. Tel. +966 (2) 6952289. Fax. +966 (2) 6952288. E-mail: skhoja@kaau.edu.sa

References

1. Li JJ, Jiang H, Hnang CX, Fang CH, Tang QZ, Xia H et al. Elevated level of plasma C-reactive protein in patients with unstable angina: its relations with coronary stenosis and lipid profile. ***Angiology*** 2002; 53: 262-272.
2. Heinrich J, Schulte H, Schönfeld R, Köhler E, Assmann G. Association of variables of coagulation, fibrinolysis and acute phase with atherosclerosis in coronary and peripheral arteries and those arteries supplying the brain. ***Thromb Haemost*** 1995; 73: 374-378.
3. Pradhan AD, Manson JE, Rifai N, Buring JE, Ridker PM. C-reactive protein, interlukin-6 and risk of developing type 2 diabetes mellitus. ***JAMA*** 2002; 286: 327-334.
4. Schalkwijk CG, Poland DC, van Dijk W, Kok A, Emeis JJ, Drager AM et al. Plasma concentration of C-reactive protein is increased in type I diabetic patients without clinical macroangiopathy and correlates with markers of endothelial dysfunction: evidence for chronic inflammation. ***Diabetologia*** 1999; 42: 351-357.
5. Gill CW, Bush WS, Burleigh WM, Fischer CL. An evaluation of a C-reactive protein assay using a rate immunonephlometric procedure. ***Am J Clin Pathol*** 1981; 75: 50-55.
6. Betteridge DJ. Lipids, diabetes, and vascular disease: the time to act. ***Diabet Med*** 1989; 6: 195-218.
7. Frohlich M, Imhof A, Berg G, Hutchinson WL, Popys MB, Boeing H et al. Association between C-reactive protein and features of the metabolic syndrome: a population – based study. ***Diabetes Care*** 2000; 22: 1835-1839.
8. Pirro M, Siepi D, Lupattelli G, Roscini AR, Schillaci G, Gemelli F et al. Plasma C-reactive protein in subjects with hypo/hyper alphalipoproteinemias. ***Metabolism*** 2003; 52: 432-436.

Risk of morbid obesity with pregnancy

Ezzeldin A. Khorshid, *MS, ABOG,*
Tarek A. Elbeheidy, *MS, MD,*
Aly M. Quinaibi, *MS, JBOG.*

Obesity is a major health concern and approximately 10% of women are obese prior pregnancy exacerbating the metabolic, hemodynamic and many co-existing problems such as hypertension and diabetes. Mothers with a body mass index (BMI) of ≥31 kg/m^2 have an increased risk of having babies with neural tube defects (NTD) or other major defects.

A 25-year-old gravida 2 para 1+0, Saudi housewife, was admitted at 39 weeks of gestation through the emergency room, complaining of low backache, she was not in labor and was unbooked. She weighed 242 kg with a BMI of 100.8 kg/m^2. All her laboratory investigations were within normal limits apart from random blood sugar, which was border high at 8.6 mmol/L controlled by diet only. Ultrasound scan was carried out and showed a viable single fetus and placental site that was difficult to localize. The patient discharged herself against medical advice. She was requested to be seen in clinic, but failed to review antenatal clinic. One year and 7 months previously, the patient's first pregnancy was ended by lower segment cesarean section (CS) for failure to progress and resulted in a full term, alive baby boy weighing 3.0 kg. She had no medical history but both parents were obese with diabetes mellitus and hypertension. She was not taking any medication and had no history of allergy. The patient was readmitted through the emergency room at 41 weeks of gestation complaining of labor-like pain increasing on the day of admission. Her blood pressure was 140/80 mm Hg, pulse rate was 94 beats per minute and temperature was 36.9^{0}C. On palpitation, the abdomen was huge with gross obesity and difficult to assess fundal level or fetal parts, fetal heart sounds were detected. The previous CS scar was not tender. Vaginal examination revealed a short, central cervix of 2 to 3 cm, which was dilated with