

**Table 1** - Paeonol synergizes with 3 chemotherapeutic drugs on the inhibition of HT-29 cell proliferation.

| Items               | A             | Inhibition rate (%) |
|---------------------|---------------|---------------------|
| Control             | 1.073 ± 0.021 |                     |
| <i>Single Use</i>   |               |                     |
| Pae                 | 0.871 ± 0.013 | (18.826)*           |
| 5-FU                | 0.751±0.028   | (30.002)*           |
| MMC                 | 0.749 ± 0.030 | (30.151)*           |
| DDP                 | 0.745 ± 0.019 | (30.569)*           |
| <i>Combined use</i> |               |                     |
| Pae+5-FU            | 0.280 ± 0.009 | (73.884)*†          |
| Pae+MMC             | 0.373±0.025   | (65.267)*†          |
| Pae+DDP             | 0.497 ±0.018  | (53.713)*†          |

Concentration of Pae - 7.81 mg/L, 5-FU - 10 mg/L, MMC - 0.5 mg/L, DDP - 10 mg/L. \* $p < 0.01$ ; † $p < 0.01$ , 5-FU - 5-fluoro-2,4(1H,3H)pyrimidinedione, MMC - mitomycin C, DDP - diamminedichloroplatinum, Pae - Paeonol, A - absorbance value by the use of spectrophotometer

nuclear condensation and fragmentation as well as deep nuclear staining. Furthermore, 7.81 ml/L of Pae was combined with or without one of 3 chemotherapeutic drugs (10 mg/L 5-FU, 0.5 mg/L MMC, or 10 mg/L c-DDP) to treat the cells. As a control, all drugs were also applied respectively. There was also a blank control. Forty-eight hours later, MTT assay was performed. We saw that low dose of Pae achieved a significantly synergistic effect with 5-FU, MMC or c-DDP in the inhibition of HT-29 cell growth ( $p < 0.01$ ). Paeonol had the most prominent synergistic effect with 5-FU (Table 1). Therefore, we came to the conclusion that, besides its direct anti-tumor activity, Pae might sensitize cancer cells to multiple chemotherapeutic drugs. Low dose of Pae (7.81 mg/L) could only inhibit HT-29 cell growth by 18.826%, whereas its combined use with 5-FU, MMC and c-DDP at a concretion of  $IC_{30}$  achieved an inhibitory rate of 73.884%, 65.267% and 53.713%, respectively. The combined use of Pae with chemotherapeutic drugs was significant ( $p < 0.01$ ).

In conclusion, plant extract Pae possesses the anti-tumor and immunity-promoting activity with no apparent side effects. We are expecting that combined application of Pae in the clinical treatment of colorectal cancer with 5-FU would enhance the efficacy of the chemotherapeutic drug with less side effects due to a reduced dose.

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From the Department of Gastroenterology, Renmin Hospital of Wuhan University, Wuhan, Hubei, People's Republic of China. Address correspondence and reprint requests to: Prof. Shiyun Tan, Department of Gastroenterology, Renmin Hospital

of Wuhan University, 238 Jiefang Road, Wuhan 430060, Hubei Province, People's Republic of China. Tel. +86 (27) 88049984. Fax. +86 (27) 88042292. E-mail: qiancuijuan2006@sina.com

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## Household cardiovascular health education. A school-based approach

Bagher Larijani, MD, Hossein Fakhrzadeh, MD, Anahita Hamidi, MD, Ramin Heshmat, MD, PHD, Rasul Pourebrahim, MD.

There is no doubt that control of risk factors is an effective strategy in primary prevention of cardiovascular disease. Lifestyle behaviors such as unhealthy diet and physical inactivity contribute significantly to the progression of cardiovascular disease.<sup>1</sup> Cardiovascular health promotion in children has the potential to reduce the risk of atherosclerosis in both the children and their families. Schools provide an excellent setting for introducing comprehensive health education and promotion as a public health approach to the general population. Furthermore, it is suggested that involvement of families in school-based programs is feasible and effective.<sup>2</sup>

Like many other countries, coronary heart disease (CHD) is the leading cause of mortality and morbidity in Iran.<sup>3</sup> The process of urbanization and corresponding lifestyle changes has been associated with increase in the prevalence of CHD. On the other hand, the population of Iran is relatively young. This provides an opportunity to prevent cardiovascular disorders since childhood. As many people in Iran still do not have enough information on cardiovascular risk factors, we performed this school-based educational intervention to investigate its effect on the improvement of cardiovascular health knowledge in targeted households. The study was carried out on ordinary households of 1000 fifth-grade boys and

girls selected at random from schools within a single educational district of Tehran. Both the pre and post questionnaires had 48 questions, each of them has one score. The questionnaire was tested before embarking on the study. The children were considered as conduits of information and they were asked during the briefing session to encourage every member of their household to take an interest in the study and the educational material supplied. Then the children received the educational materials. They were also supplied with a trigger object (T-shirt), which they had to wear for as much as possible of the survey time that they spent with at least one member of their household. All members of the families were encouraged by their fifth-grader to study the material individually or together in proper time. The study period lasted 7 days from the date on which the material was handed to each child. Seven days after the handover date, each child received a post test questionnaire. The children took the questionnaires home and asked the household to help complete it. The questionnaires aimed to assess collective and not individual knowledge. After collection of all the pre and post- test questionnaires, the data were analyzed using appropriate statistical methods. All data were analyzed using the Statistical Package for Social Sciences version 11. Differences before and after intervention were investigated using paired-sample t-test and chi-square test. A  $p$  value 0.05 was considered as significant. A total subjects of 1000 fifth grade students were invited of which 701 [394 boys and 307 girls] accepted to participate in the study. There was a significant improvement in the cardiovascular knowledge scores of parents after intervention ( $p=0.001$ ). We presented the “before and after intervention knowledge levels of parents” in **Table 1**.

There was a greater rise in the health knowledge scores of sons' families in comparison to daughters' families ( $p=0.004$ ). Educational levels of the families had no significant effect in raising their knowledge after intervention ( $p=0.28$ ). In addition, no difference was

observed between the families with university education and those without university education ( $p=0.65$ ).

In evaluating the role of nutrition of CAD in pre test, 85% of the families knew about the effect of nutrition on CAD. However, after intervention this rate increased to 92.1%. In asking the subjects on the factors which caused overweight and obesity, 94.8% of the subjects believed that it is caused by overeating and low physical activity. In pre-test, 95.2% believed that regular diet and exercise are the best ways to control body weight. However, after intervention this rate increased to 98.6%. Coronary heart disease is currently the leading cause of mortality and morbidity in Iran. Several risk factors are known to be associated with an increased incidence of cardiovascular disease. These risk factors often have their roots in childhood.<sup>4</sup> As for improving some of the cardiovascular risk factors like sedentary lifestyle and nutrition the entire family must be involved, so primary prevention and intervention through risk factor modification can be effective in both the children and their parents.<sup>5</sup> Most of the school-based health programs are not only directed to children but also to all groups in order to promote healthy lifestyle. The present study is one of the few school-based programs in Iran. Our aim was to increase the knowledge in families of children in order to induce positive health behaviors both in children and their families. To assess the effectiveness of intervention components, we need to increase health knowledge first, so our primary outcomes were to increase knowledge on high-fat foods and other classic risk factors for cardiovascular disease. We used family packs and trigger objects (T-shirts) to motivate the subjects. Based on the results of our studies and regarding the fact that our population is very young, we suggest using school-based programs for promoting healthy lifestyle in the general population. The difference between sons' and daughters' families in health knowledge may be due to our cultural background in which families pay more attention to boys in comparison to the girls. One of the limitations of our study was that we did not divide the children into intervention and control groups. The reason was that we needed a strong incentive for children to participate in the study. As the trigger objects were planned to be awarded just to the intervention group, we experienced some problems in allocating children to the control group. For this reason, we could not compare the efficacy of this methods with other studies. Ineffectiveness of the role of parental educational on cardiovascular health knowledge suggest that in our country health educational programs are successful in all families regardless of the difference between their educational levels.

This school-based educational intervention program was effective in improving cardiovascular risk factor knowledge in both the children and their families in

**Table 1** - Knowledge levels of parents of sons and daughters before and after intervention.

| Knowledge level | Frequency (%)       |            |                    |            |
|-----------------|---------------------|------------|--------------------|------------|
|                 | Before intervention |            | After intervention |            |
|                 | Sons                | Daughters  | Sons               | Daughters  |
| Low             | 4 (1)               | 7 (23)     | 3 (0.8)            |            |
| Moderate        | 139 (35.3)          | 115 (37.5) | 42 (10.9)          | 54 (18.1)  |
| High            | 251 (63.7)          | 185 (60.3) | 340 (88.3)         | 245 (81.9) |

addition to being cost-effective. However, the long-term effects remain to be evaluated. Further studies are warranted to assess the impact of such program on cardiovascular health attitudes and behaviors.

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*From the Endocrinology and Metabolism Research Center, Tehran University of Medical Sciences, Tehran, Iran. Address correspondence and reprint requests to: Dr. Bagher Larijani, Professor of Endocrinology, Endocrinology and Metabolism Research Center, Doctor Shariati Hospital, North Kargar Avenue, Tehran 14114, Iran. Tel. +98 (21) 88026902. Fax. +98 (21) 88029399. E-mail: emrc@sina.tums.ac.ir*

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## Changes of the immune status in pregnancies complicated by diabetes

*Shatha T. Al-Zubeiri, MBChB, CABGO,  
Tara S. Al-Charmiwndi, MSc,  
Marwan Al-Nasiri, MBChB, CABGO.*

**D**iabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defect in the insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction and failure of various organs.<sup>1</sup> Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy and in most cases resolves after pregnancy. Virtually, all new cases of

diabetes in pregnancy are a transient form of type 2 DM. The prevalence of GDM in a given population is thought to vary in direct proportion to that of type 2 DM. This depends on the various demographic characteristics of the specific geographic population, including age and ethnic group, and is generally reported as 2-5%. Approximately 50% of women diagnosed with GDM during pregnancy develop overt type 2 DM.<sup>1</sup> Usually during mammalian pregnancy, large physiological adjustments are required in the mother. These changes result from signals passing between the conceptus (especially the trophoblast) and the mother throughout pregnancy. Immune adaptation is not required for the mother to cope with the fetus as an allograft. The lack of HLA antigens on the syncytiotrophoblast and the presence of only the non-classic HLA G antigen on the cytotrophoblast cells precludes the fetal trophoblast from playing any part in currently recognized types of allogeneic immune reactions. All these reactions depend on the cellular recognition processes associated with the major histocompatibility complex classes I and II, therefore, the maternal immune system fail to be stimulated by allogeneic trophoblast, but allogeneic trophoblast cannot be the target for otherwise armed maternal cytotoxic T cells. Furthermore, according to current understanding of the phenomenon of "major histocompatibility complex restriction," the absence of classic major histocompatibility complex antigens on the trophoblast will prevent the corecognition of any other form of cell surface antigens that it might express. So the mother is not "immunodeficient": but she remains immunocompetent throughout pregnancy.<sup>2</sup> This study was conducted on a 40 pregnant ladies in their third trimester of pregnancy who were admitted to the obstetrical ward in Al-Kadhmiya teaching hospital/ Baghdad from January 2005 to December 2005 for control of their blood sugar, 20 of them were diagnosed as gestational diabetes in current pregnancy (all of them had impaired glucose tolerance test), another 20 patients included in the study were known diabetic patients before pregnancy in their third trimester of pregnancy. Ten pregnant ladies comparable to the same age and gestational age, without any current or previous medical history for diabetes were taken as control positive group. And 10 non-pregnant ladies comparable to same age were taken as control negative. Cases with multiple pregnancies were excluded from the study. Blood sample (5 milliliters of blood) were collected from each patient without anticoagulant, let to clot and then centrifuge at 3000 rpm for 5 minutes to separate the serum which was stored at -20°C until used. Quantitative measurement of serum immunoglobulin (IgG, IgM, IgA) and complement (C3 and C4) were measured by single radial immuno-diffusion method (Bio meghrab