each dressing change and that the ulcer appeared to be getting bigger. After 6 wk, she was admitted to this department with deep, infected ulcers 2 × 1 cm diam on both heels. On the right heel, the ulcer penetrated to the calcaneus. There were no signs of arterial insufficiency; her brachial blood pressure was 125 mmHg, and her right and left ankle systolic pressures were 160 mmHg. The ulcers were infected with group B *Streptococci* and anaerobes. She was given antibiotics, and her ankles were immobilized in windowed fiberglass casts, until healing took place in ~3 mo. Three weeks later, she was readmitted with pain and swelling of her right ankle. Investigation showed a calcaneal fracture with detachment and cranial dislocation of the achilles tendon, and osteolytic destruction of the calcaneus was seen on radiograms. An open fixation was performed, and her foot was again immobilized in a cast until healing after 2 mo.

DISCUSSION

DuoDerm adheres firmly to the skin and does not easily permit pus to leak out from under it as do other occlusive dressings, thus permitting early detection of infection. The lesions caused by DuoDerm have a characteristic undermined spherical appearance that is probably due to the increased pressure under the dressing.

In wounds in healthy experimental animals, it is difficult to establish streptococcal and staphylococcal infections because they heal so readily. However, applying DuoDerm to freshly produced wounds has been shown to produce suppurating infection within 1–2 days (1). Also of interest is another experimental study on the healing of full-thickness excisional wounds that showed that substances from the DuoDerm dressing are incorporated into granulation tissue and are phagocytized by large numbers of macrophages (2). The increased pressure and likelihood of increased susceptibility to infection produced by DuoDerm suggest that the recommendation that dressings may be left on an ulcer for up to 7 days should not apply to diabetic patients.

DuoDerm should be used with care in the treatment of diabetic foot ulcers. Bacterial cultures should be made from ulcers before treatment, and dressings should be changed more frequently than in nondiabetic patients.

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Effects of Oral Contraceptive Agents on Serum Fructosamine

Serum fructosamine, which measures the concentration of nonlabile serum proteins, gives an estimate of mean blood glucose levels over the preceding 2- to 3-wk period. It is reproducible, easy to perform, and less expensive than HbA_{1c} estimations (1).

We evaluated serum fructosamine in 20 lean (<120% ideal body wt; Metropolitan Life tables, 1983) healthy female volunteers. These were divided into *1*) 10 women aged 24–31 yr (mean 26.6 yr) who were using the combined contraceptive pill (OCA) containing 30 μg ethinyl estradiol and 150 μg (−)-norgestrel (Ovranette, Wyeth, Maidenhead, and Microgynon 30, Schering Burgess Hill, UK) and 2) 10 women aged 19–38 yr (mean 27 yr) who were taking no medication. Informed consent for this study was obtained in all subjects. There was no immediate family history of diabetes in either group, although one grandparent in 2 of the OCA groups and one grandparent in 3 of the non-OCA groups had non-insulin-dependent diabetes. Women in the OCA group had been taking OCA for periods of between 4 and 9 yr. In some subjects, the OCA had been discontinued for variable periods, but in all subjects, the specified OCA had been taken for at least 1 yr before the study. All women were nulliparous. After a 10- to 12-h fast, blood was withdrawn with a butterfly intravenous cannula. Blood samples were taken during the luteal phase of the menstrual cycle. Plasma glucose and serum fructosamine were analyzed by a Kone random-access analyzer (Espoo, Finland).

Fructosamine was assayed by a colorimetric reaction with a nitro blue tetrazolium Roche fructosamine test. The colorimetric test for fructosamine (glycosylated protein) is based on the ability of ketoamines to reduce nitro blue tetrazolium in alkaline medium. The rate of formation of formazan is directly proportional to fructosamine concentration and is measured photometrically. The results are expressed as 1-deoxy-1-D-morpholinofructose (DMF) equivalents (primary standard). Reference values for serum in our laboratory are 1.85–2.45 mM DMF equivalents. The coefficient of variation of the assay is <4%. All fructosamine levels were assayed in a single run. The source of the samples was unknown to the assay operator.

No interference was demonstrated between the OCA pill used in this study and the fructosamine assay, and, to our knowledge, contraceptive medication does not alter glycosylation of plasma proteins. Results were analyzed by unpaired Student's *t* test.

There were no significant differences between group

ages or weights. Mean ± SD fasting plasma glucose did not differ between groups (−4.59 ± 0.28 mM in the OCA group vs. 4.65 ± 0.40 mM in the control group). All were within the normal range. There was no correlation between fasting plasma glucose and fructosamine in either group. Mean serum fructosamine levels were 2.22 ± 0.12 mM (range 2.02–2.41 mM) in the OCA group compared to 2.06 ± 0.11 mM (1.85–2.20 mM) in the control group, which shows a significantly greater level in the former ($P < 0.01$).

The National Health and Nutrition Examination Survey 1976–1980 conducted by the National Center for Health Statistics in women 20–44 yr old has shown decreased glucose tolerance in 15.4% of OCA users compared with 6.3% in nonusers (2). The question of whether OCAs may precipitate permanent diabetes in susceptible women is not resolved, but it has been suggested that they are unlikely to do so through the mechanism of sustained blood glucose elevation (3). However, women with a history of gestational diabetes show deterioration in glucose tolerance after each birth and after OCA use (4).

In our study, involving a small number of subjects, serum fructosamine, although within the normal range, was significantly increased in the OCA users. Although fasting plasma glucose levels did not differ between groups, the increased fructosamine levels in the OCA users might cause suspicion of some subtle change in glucose metabolism in this group. Because serum fructosamine measurement is a simple and inexpensive procedure, periodic monitoring of this parameter before and during OCA use might prove worthwhile, particularly in those women who for various reasons are at risk of developing diabetes.

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Measurement by Single Injection of Polyfructosan of Glomerular Filtration Rate in Young Diabetic Patients

Approximately 35% of diabetic children show increased glomerular filtration rate (GFR) after a few years of diabetes (1,2). Such abnormality may be associated with glomerular damage in both diabetic animals (3,4) and humans (5). Inulin clearance with sustained infusion during forced water diuresis or bladder catheterization may not be well accepted by patients (6). Although simpler, measurement of endogenous creatinine clearance is not accurate enough (7). The plasma disappearance rate of ^{51}Cr-EDTA after a single bolus injection has been demonstrated to be almost equivalent to inulin clearance in measuring GFR (8). We evaluated whether the administration of polyfructosan (Inutest, Laevosan-Gesellschaft, Linz, Austria; 9) by the single intravenous bolus technique was as satisfactory as ^{51}Cr-EDTA in measuring GFR in insulin-dependent diabetic (IDDM) children and adolescents.

Polyfructosan is an inulinlike molecule that is filtered through the renal glomeruli but is neither reabsorbed nor secreted by the tubuli; unlike inulin, polyfructosan is water soluble at room temperature at any concentration. Twenty-one children and adolescents with IDDM (12 males, 9 females) were studied after informed consent was given. Mean age was 18.2 yr (range 13–25 yr), and mean duration of diabetes was 9.3 yr (range 6–19 yr). No patients had clinical proteinuria. The tests were performed on the first morning. Twenty milliliters of 25% Inutest was injected in an antecubital vein in 30 s. Meanwhile, in the contralateral arm, 1 μCi ^{51}Cr-EDTA/kg body wt was given as a single injection midway during the polyfructosan injection. Venous blood samples were drawn at 5, 15, 30, 45, 60, 75, 90, 120, 150, and 190 min for serum polyfructosan and 5, 15, 30, 60, 190, and 315 min for plasma ^{51}Cr-EDTA (8). Polyfructosan concentration was measured according to the method of Heyrovsky (10), and glucose was measured by glucose oxidase. Interference of glucose level on polyfructosan assay was evaluated by adding increasing amounts of glucose to polyfructosan at known concentrations. Statistical analysis was performed by a commercially available package (MINITAB, Pennsylvania State University), and all results are expressed as means ± SD. Regression between variables was calculated by Pearson's test.

Mean GFR with polyfructosan was 122.8 ± 14.9 ml · min^{-1} · 1.73 m^{-2}, whereas with ^{51}Cr-EDTA, mean GFR was 116.8 ± 14.6 ml · min^{-1} · 1.73 m^{-2}. The mean difference between the two simultaneously obtained values of GFR was 6.5 ± 5.5 ml · min^{-1} · 1.73 m^{-2}. A significant correlation was observed between the two clearances. The regression equation was ^{51}Cr-EDTA = 4.8 + 0.912 polyfructosan ($r = 0.930$, $P <$