split-mixed regimen. All subjects tested their blood glucose at home 3–4 times/day. At the beginning of the study, the subjects were asked to faithfully record their glucose results and insulin doses. Two months later, a glycosylated hemoglobin value was measured, and the subjects began to take 5 mg Pamine each night before bed. After 2 more mo, glycosylated hemoglobin was measured again. Analysis included changes in fasting blood glucose levels, evening intermediate-acting insulin doses or overnight insulin infusion rates, and glycosylated hemoglobin values during the 2-mo periods before and after Pamine.

After starting Pamine, many patients noted a dry mouth throughout most of the day. Five subjects dropped out. Two type I diabetic patients discontinued the drug after experiencing two overnight hypoglycemic reactions during the 1st wk despite our advice to lower the evening dose of insulin. Three type II diabetic patients dropped out as well (2 to gastrointestinal side effects of the drug and the 3rd because her private physician increased her insulin doses dramatically after her initial glycosylated hemoglobin level was elevated).

Results in the remaining 11 patients were not encouraging. The pre- and post-Pamine fasting blood glucose concentrations were 7.3 and 7.0 mM, respectively. Glycosylated hemoglobin values were 8.0 and 7.8%, respectively (normal range 4.2–6.8%). The intermediate-acting insulin dose actually increased from 13.5 to 18.3 U. In the 3 pump patients, the overnight insulin infusion rate remained essentially unchanged (0.83 vs. 0.79 U/h). When the 7 type I diabetic patients were analyzed separately, their fasting blood glucose levels were identical (6.9 mM), whereas their glycosylated hemoglobin values improved only slightly (from 8.4 to 8.0%). This lack of a noticeable effect of Pamine cannot be explained by rebound hyperglycemia, because the reported prevalences of hypoglycemia were similar before and after the drug was started.

Although anticholinergic blockade of sleep-induced growth hormone secretion may be helpful in a few patients (e.g., possibly the 2 type I diabetic patients who experienced overnight hypoglycemic reactions shortly after starting Pamine), it does not seem to be a panacea for improving diabetic control. It could be argued that our patients were well controlled and would not be the ones in whom a clear-cut beneficial effect might be seen. However, more poorly controlled patients would no doubt respond to increased doses of insulin. We believe that there are so many variables affecting diabetic control that simply abolishing sleep-induced growth secretion and attenuating the dawn phenomenon by an anticholinergic agent at bedtime will not be a clinically useful approach to achieving near euglycemia.

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Adverse Effects on Diabetic Foot Ulcers of Highly Adhesive Hydrocolloid Occlusive Dressing

DuoDerm (Convatec-Squibb) is a flexible occlusive dressing that is impermeable to oxygen and water. It has been shown to be effective in treating leg ulcers, burns, and pressure sores and is the best-selling ulcer preparation in Sweden. Few adverse effects have been reported. It is recommended that the dressing be left on the wound for as long as 7 days or until leakage occurs. However, it may not be so useful in the treatment of distal diabetic ulcers, and I report two diabetic patients who had distal lesions probably caused by DuoDerm.

PATIENT 1

A 31-yr-old woman with insulin-dependent diabetes of 19 yr duration had multiple complications; she had received a kidney transplant for diabetic nephropathy and had undergone a right below-knee amputation for gangrene. Her left big toe developed gangrene and had to be amputated. The wound healed satisfactorily with conventional treatment, and after 7 wk, only a 3 × 3-mm well-granulated superficial ulcer remained. She went to a primary health-care center, where a DuoDerm dressing was applied to the ulcer. Seven days later, she returned to the Department of Medicine with fever and pain and edema of the foot. There had been no leakage from under the dressing, and when it was removed, a deep cavity with a 3 × 3-cm-diam opening was seen extending into her midfoot. The cavity contained pus, from which group B *Streptococci* were cultured. Despite treatment with large doses of parenteral antibiotics, the necrosis progressed, and a below-knee amputation was necessary.

PATIENT 2

A 28-yr-old woman had a 24-yr history of diabetes. She had proliferative retinopathy but no visual impairment and no nephropathy. She went to her primary health-care center because of dry feet with fissures on each heel. She was prescribed DuoDerm, with dressing changes ordered every 3 days. The patient reported that a yellow, foul-smelling wound exudate was exposed at

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