**Materials and Methods: General Health:** Urine was monitored three times a week in diabetic prone BB Wistar rats for the presence of glycosuria. When glycosuria was present tail blood glucose (BG) levels were measured. Once these levels reached 250mg/dL or greater the animals received a subcutaneous injection of insulin. Non-diabetic animals received a blank injection. Blood glucose levels were monitored regularly. Fracture: Fourteen days after the onset of the disease, a mid-diaphyseal transverse fracture was created using the methods described by Bonnarens and Einhorn3. Ultrasound: US was applied to IDDM and non-diabetic rats for 2, 4, and 7 days post fracture for the evaluation of cellular proliferation. Animals selected for mechanical testing were treated for 6 weeks post fracture. The Sonic Accelerated Fracture Healing System (SAFHS, 1.5MHz frequency, 30mW/cm² intensity, 3.88 cm² contact area) by Exogen (Piscataway, NJ) was used. Immunohistochemistry: BRDU was injected into non-treated and ultrasound treated non-diabetic rats to evaluate cellular proliferation (table 2). Mechanical Testing: Significant differences were observed between the non-treated diabetic and control groups. A significant difference was also observed between the ultrasound treated diabetic group and the diabetic group.

**Results:** General Health: The average levels of BG taken over the length of the experiment appear in Table 1.

**Introduction:** Insulin dependant diabetes mellitus (IDDM) is an autoimmune disease that disrupts the body’s ability to produce insulin, and thus regulate the level of glucose in the blood. IDDM is associated with numerous systemic complications, including the impairment of fracture healing. Common problems include delayed unions, non-unions, and pseudoarthrosis. Previous studies conducted in our laboratory have demonstrated that IDDM BB Wistar rats have lower levels of cellular proliferation during the early phases of fracture healing, and lower mechanical strength in later phases of fracture healing than do non-diabetic prone BB Wistar control rats1. Low-intensity ultrasound (US) has been shown to increase mechanical strength in non-diabetic Long-Evans rats2. We chose to evaluate the effect of ultrasound on cellular proliferation and mechanical strength in IDDM BB Wistar rats and compare the results to diabetic (DM) and non-diabetic control rats.

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