Ned. Tijdschr. Geneesk. 76 (1932) 304–311
Richards, R. B., Edwards, J. R., Cook, R. D. and White, R. R. Bovine generalized glycogenosis. *Neuropathol. Appl. Neurobiol.* 3 (1977) 45–56
Schiaffino, S. and Hanzlíková, V. Autophagic degradation of glycogen in skeletal muscles of the newborn rat. *J. Cell. Biol.* 52 (1972) 41–51
Sengel, A., Stoebner, P. and Isch, F. Une myopathie vacuolaire: "La glycogénose autophagique à début tardif". *Ann. Anat. Pathol.* 16 (1971) 47–54
Walvoort, H. C. Glycogen storage disease in animals and their potential value as model of human disease. *J. Inher. Metab. Dis.* 6 (1983) 3–16
Walvoort, H. C., van den Ingh, T. S. G. A. M. and van Nes, J. J. Glycogenosis type II in the dog. *Berl. Münch. Tierärztl. Wochenschr.* 94 (1981) 39
Walvoort, H. C., van Nes, J. J., Stokhof, A. A. and Wolvekamp, W. T. C. Canine glycogen storage disease type II (GSD II): a clinical study of four affected Lapland dogs. *J. Am. Anim. Hosp. Assoc.* 20 (1984a) 279–286
Walvoort, H. C., Slee, R. G. and Koster, J. F. Canine glycogen storage disease type II. A biochemical study of an acid α-glucosidase-deficient Lapland dog. *Biochim. Biophys. Acta* 715 (1982) 63–69
Walvoort, H. C., Slee, R. G., Sluis, K. J., Koster, J. F. and Reuser, A. J. J. Biochemical genetics of the Lapland dog model of glycogen storage disease type II (acid α-glucosidase deficiency). *Am. J. Med. Genet.* 16 (1984b) (In press).

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Case Report

SANDHOFF DISEASE: 36 CASES FROM CORDOBA, ARGENTINA

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Sandhoff Disease (SD) (McKusick 26880) results from a deficiency in the activities of the two major isoenzyme forms, A and B, of *N*-acetyl hexosaminidase (Hex). Cases have been described in Europe, North America and, more recently, in Lebanon. This entity has previously been unknown in Latin America but over a period of approximately seven years we have diagnosed no less than 36 cases belonging to 27 families, most of which traced their ancestry to an American subgroup of the western Córdoba region called "Valle de Traslasierra" (Kremer and Levstein, 1980).

Patients with SD were ascertained through hospital records, local medical practitioners and genealogical information. A positive diagnosis was confirmed by enzymatic analysis in 33 patients (eight were siblings of previous confirmed cases) and in the remaining 3 by typical clinical and pathological findings. The clinical course of all patients was similar to that in previous reports. Additional observations were precocious and constant gingival hypertrophy and absence of hepatosplenomegaly or cardiac involvement (conventional studies). In two patients (7 and 10 months old) ERGs were of a high amplitude and normal waveform and VECPs were extinguished. Corneal turbidity was seen in one patient. Death occurred between 15 and 35 months of age.

Procedures for serum Hex, with fluorogenic and chromogenic substrates, separation of brain gangliosides (autopsy) and chromatographic studies of the glycolipid fraction of blood have been described elsewhere (Kremer and Levstein, 1980). Lysosomal hydrolases in leukocytes and serum were assayed employing *p*-nitrophenyl derivatives of the appropriate substrates.

Total serum Hex by the fluorometric method was 225–680 μmol ml^{-1} h^{-1} for heterozygotes (parents and siblings) but 11 of 30 controls gave results in the same range. With the chromogenic substrate the heterozygote range was 220–600 μmol l^{-1} h^{-1} with all controls above the heterozygote levels at 650–1800 μmol ml^{-1} h^{-1}. The patients showed Hex levels between 1.76 and 130 μmol ml^{-1} h^{-1}. Based on this we selected the chromogenic method to identify homozygotes and carriers of the gene for SD. In the carrier group, the fraction of Hex B stable to heating at 49 °C for 2 h varied between 18 and 64%. β-Galactosidase activity in leukocytes was reduced in 11 heterozygotes and in three of four patients (range 214–390 nmol (mg protein)$^{-1}$ h^{-1}, controls 400–600). α-Manosidase activity in leukocytes was also decreased in 10 of 12 heterozygotes (range 135–365 nmol (mg protein)$^{-1}$ h^{-1}, controls 390–900). The other two heterozygotes, showing values of 690–1200, were of the same family. In serum, four of five patients showed an increase of α-manosidase activity (range 82–128 μmol ml^{-1} h^{-1}, controls 30–80).

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Reference

Kremer, R. D. and Levstein, I. M. Enfermedad de Sandhoff o Gangliosidosis GM2, Tipo II. Alta frecuencia del gen en una población criolla. *Medicina (Buenos Aires)* 40 (1980) 55–73