Cortico-striatal communication in dystonic dt^{sz}-hamster brain slices

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Dystonias are frequent, often therapy-refractory movement disorders. Primary dystonias prevail, whose pathophysiology is unknown. Dystonic mutant dt^{sz} hamsters represent a model for primary dystonia. In previous studies (a) striatal interneuron density was determined to be low, and spontaneous firing rates in striatal output neurons high and (b) sodium currents in output neurons were particularly resistant to pharmacological blockade. Here, we explored whether these phenomena impact on cortico-striatal communication. Evoked activity (neocortical afferent stim) was recorded intra- and extracellularly from the striatum in combined cortico-striatal slice preparations from dystonic and control animals. Extracellular recordings revealed a higher proportion of population spikes at saturating stimulation strength (80% vs. 57%), a left-shift of the input/output curve (population spike amplitude 1.6 vs 1.0 mV), more frequent paired-pulse accentuation (54% vs. 21% of slices) and LTP (75% vs. 54% of slices after tetanic stiumlation) in slices from dystonic animals. Cellular properties as input resistance, time constant, resting membrane potential, action potential amplitude and firing patterns were not different between control and dt^{sz} tissue. In conclusion, striatal responses to afferent stimulation showed a tendency towards a higher excitability level in dystonic hamster slices.