Exploring Antipsychotic-Induced Changes in Peripheral Sensory Neurons: Insights from the F11 Cell Line

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Antipsychotics have known effects on the development of neurons and in neurite length in the central nervous system (Frost et al., 2010). However, their effects on peripheral neurons are not well understood, and data on their impact on neuropathic pain are contradictory (Kim et al., 2022). The F11 cell line, an immortalized sensory neuron line, has been used to investigate the effect of antiviral and antitumor drugs on peripheral neurons as well as to explore new drugs and targets for the treatment of neuropathic pain (Martínez et al., 2024).

The hypothesis of this study is that F11 cells could be a useful model for studying the effect of typical and atypical antipsychotic drugs on sensory neurons. The objectives were to evaluate the effects of various antipsychotics on calcium response and neurite length in differentiated F11 cells.

The study utilized the F11 cell line to investigate the effects of typical (haloperidol) and atypical (quetiapine and risperidone) antipsychotics. Cells were stimulated with 30 mM KCl to measure calcium influx using fluorescence imaging techniques. Neurite length was assessed after treatment with different concentrations of the drugs. Both haloperidol and the atypical antipsychotics (quetiapine and risperidone) induced a significant increase in calcium influx in F11 cells in response to KCl stimulation ($p<0.05$, Dunnett's test). However, the effect on neurite length varied: haloperidol caused a dose-dependent reduction in neurite length, while atypical antipsychotics did not produce a significant reduction.

These findings demonstrate that F11 cells are an effective model for evaluating the effects of antipsychotics on sensory neurons. The distinct effects observed between typical and atypical antipsychotics could explain the variability in pain perception in patients undergoing antipsychotic treatments as reported in the literature, suggesting new avenues for studying the impact of antipsychotics on neuropathic pain.

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