8th WORLD CONGRESS of PEDIATRIC SURGERY
WOFAPS
12-15 November 2025
Titanic Mardan Palace Hotel
ANTALYA, TÜRKİYE

西安交通大學
XI'AN JIAOTONG UNIVERSITY

Macrophage Polarization-Regulated CXCL5 in Neural Development and Susceptibility to Enterocolitis in Hirschsprung's Disease

Bin Yang , Heng Guo , Qiang Huang

Pediatric Surgery, The Second Affiliated Hospital of Xi'an Jiaotong University, China

Introduction

To elucidate the CXCL5-driven neuro-immune dysregulation in HSCR, this study examines how macrophage polarization differentially regulates CXCL5 in stenotic and dilated bowel segments. The goal is to define how this axis contributes to impaired neurodevelopment and immune imbalance, thereby driving the pathogenesis of Hirschsprung's disease (HSCR) and Hirschsprung-associated enterocolitis (HAEC).

Methods

Animal Model: Transcriptomic analysis of an HSCR animal model compared macrophage (M1/M2) polarization and CXCL5 expression levels in aganglionic (stenotic) and dilated bowel segments versus controls.
Cellular Assays: A neuronal injury model was established by treating SH-SY5Y cells with the IC50 of Benzalkonium chloride (BAC). Conditioned media from polarized THP-1-derived M0, M1, and M2 macrophages were collected and used in co-culture experiments to assess their effects on BAC-injured SH-SY5Y cell apoptosis and proliferation.

Results

1.Measurement of CXCL5 Levels.

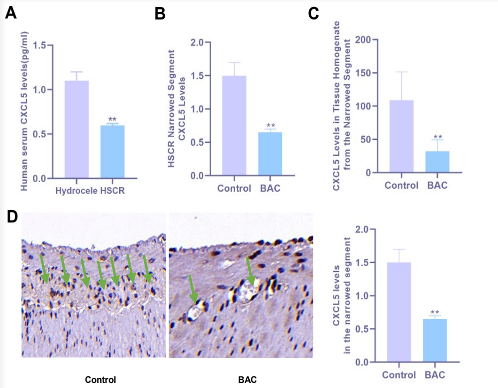

Fig 1. Reduced CXCL5 in the Aganglionic Segment.

2.Establishment of a Cellular Model for HSCR

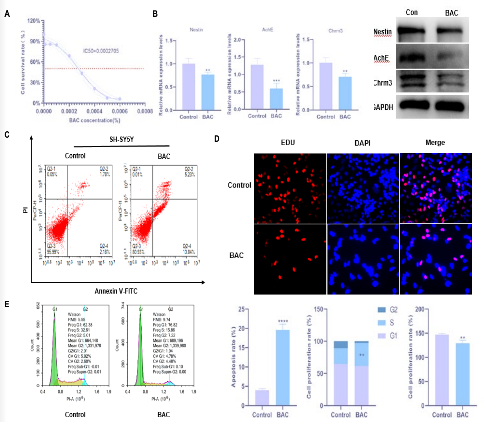

Fig 2. Successful Generation of a Cellular HSCR Model.

3.In Vitro Co-culture System

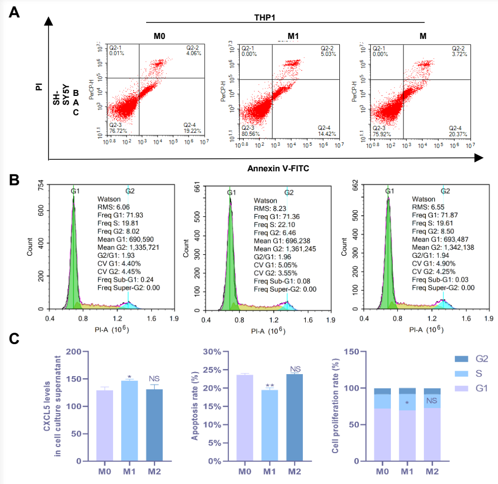

Fig 3. M1 macrophages mediate a neuroprotective role.

In a BAC-induced neuronal injury model, only M1-macrophage conditioned medium—correlating with peak CXCL5 secretion—significantly rescued SH-SY5Y cells from apoptosis and restored proliferation, an effect absent with M2-conditioned medium.

Conclusion

Our findings support a model where the compensatory M1/CXCL5 upregulation in the dilated segment undergoes a neuroprotective-to-pathogenic transition. The sustained high-level CXCL5 secretion, initially beneficial for neurons, is hypothesized to become a key driver of HAEC by priming the mucosa for rampant neutrophil infiltration and fulminant inflammation.

All authors disclosed no relevant relationships