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P19. GUT-BRAIN AXIS: BUTYRATE EFFECTS IN ANTIBIOTIC-INDUCED INTESTINAL INJURY ASSOCIATED TO PARKINSON'S DISEASE IN MICE

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Early involvement of gut is observed in Parkinson's Disease (PD) and symptoms, such as gastrointestinal dysmotility, and digestive disorders, may precede motor ones. [1] A recent study demonstrated the link between gut microbiota alteration in PD patients and a reduction of bacteria producing short chain fatty acids (SCFAs). [2] Among these, butyrate has been shown to improve motor functions when administered in PD animals; moreover, it exerts beneficial effects in the gut, reducing inflammation, improving gut integrity, visceral sensitivity and intestinal motility. Here, we investigated whether antibiotic-induced gut alterations are involved in worsening PD symptoms and the effects of sodium butyrate (BuNa) in modulating brain and gut bidirectional interplay. In order to induce gut microbiota dysbiosis, mice were treated with ceftriaxone (CFX, 8 g/kg, per os) for 5 days; [3] afterwards mice were injected with 6-hydroxydopamine (6-OHDA, 4 µ g/2µ l) in the right striatum. [4] Mice challenged with 6-OHDA or with CFX and 6-OHDA were treated with BuNa (100 mg/kg os) once daily for 14 days. Here, we demonstrated the worsening effects of CFX administration in PD pattern and BuNa capability in improving motor deficit in both 6-OHDA and 6-OHDA+CFX mice. These behavioural motor effects were related to BuNa-induced reduction of inflammatory, oxidative and apoptotic parameters at striatal level. Moreover, we demonstrated that BuNa improved colonic inflammation and integrity altered by both CFX and/or 6-OHDA, which mirrored the reduction of serum inflammatory mediators. These findings addressed gut alterations as risk factor for PD and BuNa therapeutic potential in limiting PD progression.

References

[1] Mulak and Bonaz 2015
[2] Unger et al. 2016
[3] Ling et al. 2015
[4] Avagliano et al. 2016