Effect of latent infections on the development of experimental inflammatory bowel disease

Martina Perše
Animal models of IBD

generation:
- spontaneous
- induced
  - Chemicaly (DSS, TNBS)
  - microbiologically
- Geneticaly modified
- combinations

damage of immune system of mucosa:
- Damage in integrity of epithel
- Damage of NK defence
- Damage of cells of acquired immune system
IBD - incidence
aetiology

- intrinsic
- Mikroflora
- extrinsic

[Diagram showing the relationship between microbes, host factors, innate and adaptive immunity, and other environmental factors leading to IBD.]
Review Article

Dextran Sodium Sulphate Colitis Mouse Model: Traps and Tricks

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Inflammatory bowel disease (IBD) is a complex multifactorial disease of unknown etiology. Thus, dozens of different animal models of IBD have been developed in past decades. Animal models of IBD are valuable and indispensable tools that provide a wide range of options for investigating involvement of various factors into the pathogenesis of IBD and to evaluate different therapeutic options. However, the dextran sulphate sodium (DSS-) induced colitis model has some advantages when compared to other animal models of colitis. It is well appreciated and widely used model of inflammatory bowel disease because of its simplicity. It has many similarities to human IBD, which are mentioned in the paper. In spite of its simplicity and wide applicability, there are also traps that need to be taken into account when using DSS model. As demonstrated in the present paper, various factors may affect susceptibility to DSS-induced lesions and modify results.
DSS colitis

strain: C57BL/6JOlaHsd
age: 7-12 weeks
microbiological state: SPF

induction:
DSS 3% solution for 5 days
Example – protocol

- Monitoring and scoring
  - On daily basis (weekends included)

  - The amount of consumed solution/water
  - Body weight
  - Clinical picture of animals
  - Feces

3% DSS 5 days

autopsy:
1 week
N=10
4 weeks
N=10
Autopsy

- Body weight
- General morphological examination
- Weight of organs
- Lymph nodes
- Gastrointestinal tract
- COLON – length, luminal content, appearance, fixation
Autopsy
Relativna teža vranice

F0 = zdrave netretirane miši

3% DSS 5 days

Autopsy: 1. week N=10

1. week N=10

4. week

F0, F1, F2, M1, M2

0,22

0,42

0,62

0,82

%
Lymph nodes
Colon

• Length of wet colon

• Histological evaluation
  – inflammation
    • Depth (mucosa – transmural)
    • Acute/chronic
  – Erosion
  – Squamous metaplasia of rectum
Length of colon and lesions

- **F control**: 80 mm
- **M control**: 80 mm
- **F-d7**: 60 mm
- **M-d7**: 60 mm
- **F-d28**: 40 mm
- **M-d28**: 40 mm

- Squamous overgrowth
- Erosion
- Inflammation
- Normal

3% DSS 5 days
- F-d7: 1 week
- M-d7: 1 week
- F-d28: 4 weeks
- M-d28: 4 weeks

Autopsy:
- N=10

N=10
Length of colon and lesions

- F control
- M control
- F-d7
- M-d7
- F-d28
- M-d28

mm

- squamous overgrowth
- erosion
- inflammation
- normal
Clinical scoring

Body weight loss
Length of colon and lesions

control

d7-inf

d7

m1

m3

m3-inf

mm

0 20 40 60 80 100

squamous overgrowth  erosion  inflammation  normal

3% DSS 5 days
d7
m1
m3

autopsy:
1 week
4 weeks
3 months
N=10
N=10
N=10
Colon

DSS-infected
Colon

adenocarcinoma
Thanks to:
Thank you for your attention