

The Numb-Like Gene, Which We Detected in the Testes of Flutamide-Induced Cryptorchid Rat Model, May Take Part in Spermatogenesis

Introduction and Objective: Spermatogenesis failure occurs in 70% of patients with non-obstructive azoospermia, but the cause is poorly understood. If there are differences in spermatogenesis between the normal testis and the undescended testis in the same individual, a genetic cause may likely be involved in the spermatogenesis. Therefore, we used an experimental cryptorchid rat model as a spermatogenesis failure model, and we investigated the gene involved in spermatogenesis.

Materials and Methods: Flutamide was injected into the abdomen of pregnant rats, to induce unilaterally cryptorchid rats. We compared the normal testis with the undescended testis. The testes were removed 4 weeks after birth and we investigated gene differences between the pairs of testes using microarray analysis. Spermatogenesis was evaluated by hematoxylin-eosin staining, at the same time the immunohistological staining was examined.

Results: At 4 weeks of age, there was no difference in testis weights and spermatogenesis between the normal testis and the undescended testis. Of 18026 genes detected, 213 genes showed a decrease in expression to less than half in the cryptorchid testis. We detected significant differences in the Numb-like gene, which is concerned with the control of stem cell growth and differentiation and is a regulatory factor in the Notch signaling pathway. On immunohistological staining, it was shown that the difference in the Numb-like gene expression affected the development from round spermatid to elongated spermatid.

Conclusions: The Numb-like gene is involved in the signaling pathway by the cell joint in nerve occurring and perhaps affecting both stem cell differentiation and nerve development. Based on the present findings, we consider that the Numb-like gene also plays a very important role in spermatogenesis.