

Runting in the Offspring of Mice inoculated with homologous or heterologous Bone Marrow *

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In a recent study on runt disease in mice, we observed runts in a litter derived from mice which were injected, when newborn, with homologous bone marrow (1). While it is well known that runt disease can be transferred from runts to normal newborns (2, 3) there is not, to our knowledge, any reported observation of runting in the offspring of animals inoculated with foreign cells.

The purpose of this note is to report the results of a group of experiments which were undertaken in order to control the reproducibility of our previous observation.

Procedure

F₂ hybrids, derived from crosses between B6D2F₁/Jax mice [hereafter indicated as B6D2(F₂)], were used as recipients. AKR mice were used as donors in homologous bone marrow inoculations, and WR/Fu rats or Syrian hamsters, in heterologous inoculations. All mice were inoculated within 24 hours after birth. Donor bone marrow cells were injected into the orbital branch of the facial vein, using a #30 gauge needle. The number of cells injected varied between 2×10^6 and 5×10^6 . At about 5-6 weeks after inoculation, the surviving animals were caged in groups of 2-3 females, and 1-2 males, for mating purposes. In one group of experiments, B6D2(F₂) inoculated females were crossed with B6D2(F₂) inoculated males, and in a second group of experiments, B6D2(F₂) inoculated females were crossed with B6D2F₁ normal males. As control groups, normal males and females of the same F₁ and F₂ hybrids were bred.

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Results and conclusions

A varying incidence of runts was observed in the litters derived from the inoculated animals (Table 1), while no runts were observed in 173 newborns obtained in the control groups.

Tab. 1. Runting in offspring of marrow-inoculated female mice

Marrow donor	Incidence of runting ^a in offsprings of inoculated B6D2(F ₂) females mated to:	
	Normal B6D2F ₁ males	Inoculated B6D2(F ₂) males
AKR Mouse	0/29	19/98
WR/Fu Rat	3/44	7/11
Syrian Hamster ^b	1/4	17/69

^a Number runted offspring / total offspring.

^b Dennen Animal Industries, Gloucester, Massachusetts.

The arrest of growth in the runts was of varying degrees. Some were extremely stunted, while others showed only moderate growth retardation. The runts with severe arrest of growth very often showed rough fur, hunching, and unsteady gait. Diarrhea was observed in some runts. Alopecia was noted in only a few instances. Many runts showed a high degree of excitability, at least during certain phases of the disease. All runts which were not sacrificed died between 1 and 5 weeks after birth.

In the litters obtained from both inoculated parents, the incidence of runting appeared to be definitely higher than in the litters obtained from crosses between inoculated females and normal males. This should suggest that both parents contributed to the runting in the offspring, but it cannot be ruled out that a variation in vigor between the offspring derived from the F₁ males, and the ones derived from the F₂ males might have had some influence in determining the difference in incidence of runts in the two groups of litters. Further investigation is needed to evaluate the role played by each parent in the transmission of runting, and to clarify its pathogenesis.

Summary

Runts were observed in the offspring of mice which were injected, when newborn, with foreign bone marrow cells. The incidence of runting in the litters obtained from crosses between *injected females* and *injected males* was higher than in the litters obtained from crosses between *injected females* and *normal males*.

References

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RIASSUNTO

Alcuni « runts » sono stati osservati nella prole di topi iniettati, nel periodo neonatale, con midollo osseo omologo o eterologo. La frequenza del fenomeno nei topi risultanti dall'incrocio fra *femmine iniettate* e *maschi iniettati* è risultata superiore a quella riscontrata nei topi risultanti dall'incrocio fra *femmine iniettate* e *maschi normali*.

RÉSUMÉ

Des « runts » ont été observés chez des souris dont les parents avaient été inoculés, dans la période néonatale, avec des cellules de moëlle osseuse homologue ou hétérologue. La fréquence des « runts » chez les produits du croisement *femelle injectée* × *mâle injecté* est plus élevée par rapport à la fréquence trouvée chez les descendants du croisement *femelle injectée* × *mâle normal*.

ZUSAMMENFASSUNG

Bei den Nachkommen von Mäusen, denen vor der Geburt fremde Knochenmarkszellen eingespritzt worden waren, wurden Fälle von Zwergwuchs beobachtet.

Die Erscheinung war häufiger bei den Tieren, die aus der Kreuzung von *injizierten Weibchen* mit *injizierten Männchen*, als bei denen die, aus der Kreuzung von *injizierten Weibchen* mit *normalen Männchen* herrührten.