52) Differences in the Developmental Modes of Cataract in WKY, SHR, SHRSP and Streptozotocin-treated SHR.

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INTRODUCTION

Development of cataract in rats was previously reported (Ihara,1983). Recently a classification of rat cataracts was reported in SHR strains as compared to WKY (Saito, 1988). In the present study, a precise chronological investigation of cataract was performed in WKY and its derivatives under strictly the same conditions to obtain each characteristic in developmental modes of rat cataracts.

MATERIALS AND METHODS

(A) Used rats were 38 male WKY aged from 100 days to 305 days, 150 male SHR (F67-71 of B1 and F70-74 of B2 strains) from 114 to 571 days and 132 male SHRSP (F74-75 of A1-sb and F72-74 of A3 strains). (B) Cloudiness of lenses in 6 female SHR (B2 strain), aged from 114 to 120 days after birth, treated with streptozotocin(STZ) within 1 week after birth(Weir et al.,1981) and their age-matched 6 controls were also examined. All these rats were maintained at the department of pathology, fed on a standard SP diet (Funahashi, Chiba, Japan)with tap water in their drinking water. Lenses of all rats were investigated without anesthesia with a portable slit lamp (Kowa SL-5,Japan) under mydriasis with 0.5% Tropicamide solution.

RESULTS

(A) Cataracts in rats seemed to be characterized as follows; Type 0: no cloudiness in lenses, Type I : cloudiness of nuclei in lenses, Type II : cloudiness in the posterior subcapsular areas, Type III : cloudiness of nuclei and also in the posterior subcapsular areas and Type IV : complete cloudiness in both lenses. After such a tentative classification, 38 WKY, 86 SHR and 68 SHRSP were randomly selected, and they were divided into two groups, 3 to 5 months and 6 to 9 months after birth in accordance with the stage in the development of cerebrovascular functional or organic lesions reported by Horie et al. 1978.

Incidence of cataract in rats according to a tentative classification (%)

	Age(Months)	Type 0	I	II	III
WKY	3-5	100	0	0	0
	6-9	95.2	4.8	0	0
SHR	3-5	32.4	23.6	32.4	11.8
	6-9	17.3	21.2	32.7	28.8
SHRSP	3-5	13.9	75.0	2.8	8.3
	6-9	9.4	18.8	15.6	56.4

(B) Cataracts in STZ-treated SHR were all accompanied with unilateral or bilateral swelling or atrophy, and also accompanied with iridic posterior synechia(adhesion) which might be resulted from intraocular inflammation of lenses. In contrast to those, 6 controls were all classified in Type III.

DISCUSSION

After further analyses of our tentative classification by the characteristics of cataracts in rats, it proved to be that above-mentioned classification might reveal the developmental modes of cataracts, i.e., "Type" could be replaced with "Stage". This developmental stages are not so different from those in humans. On the contrary, STZ-treated SHR seemed to have had some inflammatory changes in the eye, followed by their iridic posterior synechia to lens surface. It might be concluded that SHR strains without treatment seemed to be one of suitable models for the studies on human cataracts.