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Incidence of Mycoplasma Infection in Guinea-pigs

THE isolation of a new mycoplasma species, *Mycoplasma caviae*, was recorded recently[1]. This species has been isolated from the nasopharynx and vagina of 10% of 232 guinea-pigs and is apparently non-pathogenic to these and other common laboratory animals. During this survey, no other known species of mycoplasma were isolated. (A strain of *M. caviae* G. 122 has been lodged in the National Collection of Type Cultures and has been given the reference number NC/TC 10126.)

Although we have failed to isolate other known species of mycoplasma from 232 guinea-pigs, it has been claimed that in Germany all guinea-pigs carry *M. pulmonis* in the vagina[2]. It is interesting to speculate why the incidence of infection in Germany should be so different to that in the United Kingdom. Further information on the incidence of mycoplasma infection of guinea-pigs in different countries would be most interesting.

AURIOL HILL

MRC Laboratory Animals Centre,
Medical Research Council Laboratories,
Woodmansterne Road, Carshalton, Surrey

Received June 17, 1971.

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Transplacental Transmission of Endogenous Interferon in Pregnant Mice inoculated with Influenza or Newcastle Disease Viruses

THE possibility of intrauterine infection transmitted from affected mother to foetus has been established by both clinical[7,11] and experimental[3,6,9,10] investigations. Inoculation of pregnant animals with pathogenic viruses often brings about foetal infection resulting in impaired intrauterine development. When non-pathogenic strains are used, however, pregnancy may proceed normally and result in the birth of healthy offspring[4]. It has been demonstrated repeatedly that viruses with low pathogenicity for animals are effective producers of endogenous interferon. Preliminary administration of such interferon inducers has been shown to promote non-specific protection in animals against inoculation of lethal viruses[5,8].

In our investigation we used influenza A1/3711 virus and Newcastle disease virus (NDV) which were non-pathogenic for mice for interferon induction. These viruses are known to stimulate active production of endogenous interferon in mice, resulting in development of short term insusceptibility to subsequent inoculation with lethal influenza infection[2]. The aim of our study was to test the possibility of transplacental transmission of endogenous interferon from mother to foetus with resulting activation in the offspring of non-specific immunity to infection with various viruses.

Production of endogenous interferon was induced on days 17–21 of pregnancy by intranasal instillation of 0.2 ml. of allantoic fluid containing influenza A1/3711 virus, or by intravenous administration of 1.0 ml. of NDV. Both preparations contained 10^6ID_{50}/0.2 ml.

At different intervals after A1/3711 or NDV inoculation, sera and suspensions of washed lung, placenta and foetal tissues were tested for virus and interferon content. Serum and lungs of newborn mice were tested for the same. Interferon was titrated on mouse fibroblast tissue cultures in terms of suppression of cytopathogenic action of vesicular stomatitis virus. Influenza A1 virus or NDV were inactivated in these specimens by preliminary treatment in acid medium (*p*H 2.0).

Newborn mice from experimental or control (uninoculated) mothers were challenged on different postnatal days intranasally (0.06 ml.) with mouse-pathogenic allantoic influenza AO/PR8 virus of 10^4ID_{50}/0.2 ml. activity. The inoculated sucklings were observed for 1 month.

Inoculation of influenza A1/3711 virus or NDV 3–4 days before birth did not affect the course of pregnancy, and the offspring survived the observation period.

Intranasal inoculation of pregnant mice with influenza A1 virus resulted in subclinical infection, accompanied by significant accumulation of interferon in the lungs from the first day after inoculation. Maximal values of interferon activity were obtained on days 3–4, when the level in the lungs was two to four times higher than that in bloodstream, uterus, placenta or foetuses (Table 1).

Table 1 Interferon Levels in Serum and Organs of Mice inoculated with Influenza A1/3711 or Newcastle Disease Viruses on Days 17–18 of Pregnancy

Interferon induced with virus	Specimens tested	Time of interferon titration (h after inoculation) 6–8	24	48	72	96
Influenza A1/3711	Serum*	—	2	8	32	16
	Lungs†	—	4	8	64	64
	Uterus	—	2	4	8	4
	Placenta	—	2	8	8	8
	Foetus	—	2	4	8	8
Newcastle disease	Serum	512	128	32	16	4
	Uterus	64	16	4	—	—
	Placenta	64	32	4	2	—
	Foetus	64	24	4	2	—

* Activity of interferon in U/ml. of undiluted serum.
† Activity of interferon was tested in 50% suspension of washed organs and then was calculated on wet weight.

In contrast to influenza virus, NDV induced production of maximal interferon levels in circulating blood as early as 6–8 h after inoculation. At this time, high levels were found in uterus, placenta and foetuses (64 U/ml.).

The results of this investigation demonstrate the possibility of antenatal (intrauterine) transmission of non-specific resistance from mother to foetus. A positive correlation was found between intensity of interferon production in pregnant mice by term and the grade of resistance of their offsprings against lethal influenza infection. Mice born of experimental mothers were fully protected against fatal doses of influenza AO virus if the time of birth corresponded to peak interferon production in the mother. When birth occurred during a period of minimal interferon production in the mother, the extent to which the offspring were protected against influenza AO/PR8 virus decreased considerably (Table 2).

Influenza virus AO/PR8 was 100% fatal in the offspring of uninoculated (control) mice, at any postnatal age. But the offspring of females subjected to interferon induction during pregnancy and challenged on the first, third or fifth days after birth with the same fatal doses of influenza AO virus, survived the whole observation period. Complete protection of off-