

Some basic and clinical problem in infertility and ART

Shuetu Suzuki, M.D.

Department of Obstetrics and Gynecology School of Medicine, Keio University (former)

Ginza Women's Clinic, Toyko, Japan

In 1959, M.C. Chang reported the first success of in vitro fertilization and embryo transfer in the rabbit. Since that time, it has passed more than forty years after an animal experiment was applied to the clinical practice in human infertility. It is no doubt the technical procedure for manipulation of the rabbit ova is basically same as for human materials.

Since the first report of successful in vitro fertilization and embryo transfer in human in 1978, more than twenty years have already passed. During these years a lot of research laboratories have devoted their efforts to improve to resolve the basic problem in infertility treatments. However even in the world wide scale statistics, the actual success rates of in vitro fertilization and transfer in human has been reported to be about 20 or 30% per treatment.

In order to increase the pregnancy rate of this new frontier program for human infertility clinic, it would be important to handle the basic research for embryos in the pre-implantation stage.

During the past forty years, we have investigated the physiological and biological problems in the field of animal and human reproduction, specially on oocyte maturation, fertilization, and early development of mammals including the primate.

We have reported papers as following titles in journals of reproduction.

In vitro fertilization of rabbit ova in tubal fluid

Maturation of monkey ovarian follicular oocytes in vitro

In vitro cultivation of rabbit ova follicular oocytes in vitro fertilization in tubal fluid

Maturation of human ovarian follicular oocytes in tubal fluid

Maturation of human ovarian follicular oocytes in vitro

In vitro cultivation of rat embryos

Electron microscopic observations on the cultured human follicular oocytes and granulosa cells

In vitro maturation of human follicular oocytes under non steroidal environments

Cytochemical study of steroid-producing activities of human oocytes

Biological effects of trilostane in vitro on steroid-producing activity of hamster ova

Indirect immunofluorescence studies on the steroid-producing activity of hamster ova

A cytofluorometric study of DNA synthesis in the second and third cell cycles of mouse preimplantation

development

Intercellular junctions of preimplantation embryo

Cooperative inhibitory effect of follicular fluid and cyclic adenosine monophosphate of hamster oocyte maturation

Analysis of cytoplasmic factors in developmental cleavage of mouse embryo

Involvement of protein kinase C in sperm-egg interaction

Morpho-functional characteristics of the pre-embryo

Enhancement of fertilization by micromanipulation

Meiosis inducing effects of anti-camp serum injection into oocyte by micromanipulation

Molecular mechanisms of sperm/egg interaction

Egg activation as a model of sperm-induced signal transduction

Effect of exogenous injected EDTA on 2-cell block

Effects of cell fusion/cytoplasmic microinjection on 2-cell block

Ultrastructure of the in vitro ovulated ova

Demonstration of maturation-promoting and -inhibiting activities mouse oocytes

Growth hormone and IGF-I effects on the ovaries perfused in vitro

Inhibitory effect of genitaein on mouse oocyte maturation

Signal transduction mechanisms during fertilization

At the Meeting I would like to present some of our basic research studies done in the past years.

In the areas of clinical infertility many problems have not yet been resolved. I would like to point out some of clinical problems and to discuss with clinicians.