

JASHOMAN BANERJEE, M.D.

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OBJECTIVE To develop a career in academic and clinical Obstetrics and Gynecology

EXPERIENCE *2006 –Present University of Toledo Medical Center Toledo, Ohio, USA*

Resident (Obstetrics and Gynecology -PGY-1)

- During the course of first year performed normal and complicated instrumental deliveries and cesarian sections
- Performed and assisted minor and major gynecological procedures
- Participated in regular didactics including mortality and morbidity seminars
- Participated and presented in journal clubs
- Extensive involvement as an educator / teacher for medical students

2005-2006 Cleveland Clinic Foundation Cleveland ,Ohio, USA

Research Fellow (Obstetrics and Gynecology)

- Lead research on the effects of reactive oxygen species on female reproductive function.
- Explored the effects of anti-oxidants on the microtubules and chromosomes and their capacity to reverse the effects of oxidative stress
- Experimentally explored the role of ovarian cryopreservation and reimplantation to preserve fertility in cancer patient undergoing chemo/radio therapy using sheep model.
- Developed skills on handling mouse oocytes ,embryos,immunofluorescence techniques and also using large animal like the ewe for research purposes

2002-2004 Calcutta National Medical College And Hospital Calcutta, INDIA

Postgraduate Fellow (Obstetrics and Gynecology)

- Completed postgraduate research and clinical training in order to achieve postgraduate diploma in obstetrics and gynecology (duration two years).
- During the course performed surgical techniques in gynecology and obstetrics and also undertook clinical research in various fields of the subject.

2001-2002 Wockhardt Hospital & Kidney Institute Calcutta, INDIA

Senior Resident (Uro- Surgery)

- Attended and performed surgeries in prostate, kidney, urinary bladder and other urological techniques.
- Attended emergencies in urology and have been involved actively in crisis management.
- Rendered ward duties regularly.

2000–2001 Calcutta National Medical College And Hospital, Calcutta, INDIA

Resident (General Surgery)

- Performed various major operations viz. Appendectomies, Cholecystectomies, Abdominal surgeries.
- Performed various short surgical techniques viz. putting a long line, small surgical techniques etc. including anesthetic assistance.
- Attended ward duties regularly.
- Attended & managed surgical emergencies actively & regularly.

1999-2000

Mediview Nursing Home

Calcutta, INDIA

Surgical & Medical Officer

- Attended general ward duties including emergencies.
- Attended major operations.

1998–1999

Calcutta National Medical College And Hospital

Calcutta, INDIA

Resident (General Surgery)

- Attended ward duties regularly.
- Attended & managed surgical emergencies actively & regularly.
- Performed various major operations viz. Appendectomies, Cholecystectomies, abdominal surgeries.
- Performed various short surgical techniques viz. putting a long line, circumcisions etc. including anesthetic assistance.

PUBLICATIONS

1. W.Choi, **J.Banerjee**, T.Falcone, J.Bena, A.Agarwal, R.K Sharma (2006) Oxidative stress induced alterations and protective effect of vitamin –C in metaphase-II mouse oocyte spindle structure and chromosomal alignment. *Fertility and Sterility* (manuscript accepted)
2. Ashok Agarwal, PhD, Tamer M. Said, M.D., **J. Banerjee**,M.D., Mohamed A Bedaiwy, M.D., Juan G Alvarez, M.D., PhD - Oxidative stress in an ART setting: How Can We Prevent Oxygen Radical induced Damage in the ART Laboratory - *Fertility and Sterility*
3. Gupta S, Agarwal A, **Banerjee J**: Oxidative stress and its role in spontaneous abortions and recurrent pregnancy loss: a critical review of literature. *Gynecological and Obstetrical Survey* (Submitted and accepted), 2005.
4. Gupta S, **Banerjee J**, Agarwal A (2006) Oxidative stress and embryo development. A Review. *Embryotalk*
5. Gupta S, **Banerjee J**, Agarwal A (2006) Role of oxidative stress in in-vitro maturation of oocytes A review (manuscript being edited)
6. W. Choi, **J. Banerjee**, R. K. Sharma, A. Agarwal, T. Falcone. (2006) Effect of Whole ovary cryopreservation and autotransplantation with microvascular anastomosis. (manuscript in preparation)
7. **Banerjee, J.**, Saha S.K. (2005) – Role of destructive operation in rural obstetrics of West Bengal communicated to *Journal of the Indian Medical Association*.
8. **Banerjee, J.**, Saha S.K. (2005) – Contraceptive practice in the tribal women in a tea garden of North Bengal – communicated to *Journal of the Indian Medical Association*

ABSTRACTS

1. **J.Banerjee**, R.K.Sharma, W.Choi, A.Agarwal, J.M.Goldberg, T.Falcone (2006) Protective effect of coincubating oocytes and antioxidants against oxidative stress induced alterations in metaphase-II mouse oocyte spindle - in 62nd annual Meeting of American Society of Reproductive Medicine. New Orleans. Louisiana, USA
2. **J.Banerjee**, R.K.Sharma, W.Choi, A.Agarwal, T.Falcone, A.T.Grazul-Bilska (2006) Follicular viability in cryopreserved whole ovine ovary after transplantation with microvascular anastomosis - in 62nd annual Meeting of American Society of Reproductive Medicine. New Orleans. Louisiana, USA
3. **J.Banerjee**, R.K.Sharma, W.Choi, A.Agarwal, T.Falcone, A.T.Grazul-Bilska (2006) Evidence of revascularisation in cryopreserved whole ovine ovaries after transplantation - in 62nd annual Meeting of American Society of Reproductive Medicine. New Orleans. Louisiana, USA
4. W. Choi, **J. Banerjee**, X. Zhang, R. K. Sharma, A. Agarwal, T. Falcone. (2005) Effect of Tumor Necrosis Factor- α on Oocyte Cytoskeleton and Embryo Development in Mouse - in 61st annual Meeting of American Society of Reproductive Medicine. Montreal Canada.

5. W. Choi, **J. Banerjee**, R. K. Sharma, A. Agarwal, T. Falcone. (2005) Effect of Tumor necrosis factor induced alterations in microtubule and chromosomal alignment of metaphase II oocyte - possible role in endometriosis associated infertility. - in 61st annual Meeting of American Society of Reproductive Medicine. Montreal Canada.
6. W. Choi, **J. Banerjee**, A. Agarwal, W. Paik, T. Falcone, R. K. Sharma. (2005) Combined effect of oxidative stress and tumor necrosis factor- α on mouse oocyte spindle structure. - in 61st annual Meeting of American Society of Reproductive Medicine. Montreal Canada.
7. W. Choi, **J. Banerjee**, A. Agarwal, T. Falcone, R. K. Sharma. (2005) Can vitamin C supplementation reduce oxidative stress induced cytoskeleton damage of mouse oocyte? - in 61st annual Meeting of American Society of Reproductive Medicine. Montreal Canada.
8. **Jashoman Banerjee**, M.D. Rakesh Sharma, Ph.D., Won-Jun Choi, M.D., Ashok Agarwal, Ph.D., Tommaso Falcone, M.D., Cleveland Clinic Foundation, Cleveland, OH (2005) Oxidative stress-induced alterations in Metaphase-II mouse oocyte spindle structure and beneficial effects of vitamin C supplementation in vitro – in 31st Annual meeting of the American Society of Andrology. Chicago. Illinois. USA
9. **J. Banerjee**, M.D., R. K. Sharma, Ph.D., W-J. Choi, M.D., A. Agarwal, Ph.D., T. Falcone, M.D. (2005) Oxidative stress induced alterations in the mouse oocyte cytoskeleton – in Annual Research Day at the Cleveland Clinic Foundation, Cleveland.Ohio.USA

**RESEARCH
SUMMARY**

2005

Cleveland Clinic Foundation

Cleveland Ohio,U.S.A

▪ **Explore the effects of Oxidative stress on mouse oocyte spindle and chromosomal alignment and the protective effects of vitamin-C on the same**

Oxidative stress alters microtubule structure and chromosomal alignment in metaphase-II mouse oocytes both in a concentration and time dependant manner. This might have clinical implications on patients of endometriosis as well as in assisted reproduction settings. Alterations in the spindle structure could be a possible clue towards increased aneuploidy and failed outcomes in fertilization and pregnancy. The effects of vitamin C, a well known anti oxidant were also studied in reversing or preventing oxidative damage to the spindles.

Cryopreserved mouse oocytes at the metaphase-II stage were exposed to various concentrations of an inducer, hydrogen peroxide and incubated for a particular period. The same was done for different incubation times with a particular concentration of the inducer. The oocytes were also exposed to various concentrations of vitamin C alone as well as in combination with the inducer

The oocytes were subsequently stained by Indirect Immunofluorescence technique and the spindle damage assessed. The results revealed that hydrogen peroxide caused concentration and time dependant damage of the spindle and vitamin C seemed to be protective at a particular concentration without having deleterious effects by itself

This could guide embryologists to reduce generation of oxidative stress in external media and antioxidant supplementation could be a possible answer though it requires further research

▪ **Explore the role of Oxidative stress and cytokine (TNF- α) on Female Infertility.**

Impact of oxidative stress and TNF- α on oocyte spindle and chromosomal alignment may alter the quality of the cell culminating into poor fertility outcomes both in-vivo and in-vitro. This concept may reveal one of the important aspects of infertility.

Cryopreserved mouse oocytes were observed under fluorescent microscope after Indirect Immunofluorescent staining for changes in alignment of microtubules and chromosomes in control and induced groups using standardized solutions of hydrogen peroxide and TNF- alfa.

The oocytes demonstrated definite change in morphology and even destruction of the microtubules and chromosome as a response to the induced stress.

This could possibly be the etiology to low fertility outcomes in patients with endometriosis or inflammatory diseases in both in-vivo and Assisted Reproduction methods

- **Ovarian cryopreservation with vascular supply and re-anastomosis at a heterotopic site may restore fertility in cancer patients**

Cancer patients may lose fertility due to chemo and radiotherapy. Among many options whole ovary cryopreservation with its vascular supply and reanastomosis after completion of anti cancer therapy may restore the reproductive function of the patient. Sheep as a model was used for the study. Both the ovaries were removed laparoscopically, perfused with cryoprotectant, cryopreserved in a graded manner and then kept in liquid nitrogen for a week. The cryopreserved ovaries were then taken out and perfused in the subsequent week and then transplanted at a heterotopic site in the same sheep and observed for endocrine and ovulatory changes.

This study was collaborated with the department of Animal and Range Sciences, North Dakota State University

The study is still in the process of continuation

- **Explore the effects of anti-oxidants on mouse oocyte microtubule and chromosomal alignment and their role in reversing the effects of oxidative stress**

This study targets the effects of agents such as pentoxifylline (that also have anti-oxidant properties) on the microtubule and chromosomal alignment. Their role in reversing the effects of oxidative stress on the same cellular structure will also be verified.

This study is under progress

2004

Calcutta National Medical College, Calcutta, India

Low cost non-intervention regimen for termination of pregnancy at early weeks of gestation

Women of Parity 1 or more with accidental pregnancy or planned termination at 6-8 wks of gestation were studied.

Two agents –Methotrexate and Misoprostol were utilized to induce medical termination of pregnancy following the MTP law of the state in the early gestational weeks. The fetolytic property of Methotrexate and the uterotonic property of Misoprostol was utilized

It was found that patients at or within 6 wks of gestation had 100% spontaneous abortion and had complete evacuation of the uterus without surgical aid. Patients with more than 8 wks gestation had incomplete abortion in about 60% cases & required surgical aid [D/E or D/C operation]

Methotrexate has fetolytic action and Misoprostol [prostaglandin analogue] helped in evacuation of uterus. There is an established role of RU486 [Mifepristone] +Misoprostol in early termination of pregnancy without surgical aid, but the cost of such therapy is nearly more than 1000 INR. This study aims at a lower expense of termination of pregnancy by utilizing the role of Methotrexate, and amounts to less than 300 INR.

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| EDUCATION | 1997 | <i>Calcutta National Medical College & Hospital</i> M.B.B.S., Graduated with 69.9% marks, secured highest marks in the University in Surgery and Medals for the same. Ranked 3rd in college | Calcutta, INDIA |
| | 1992 | <i>St. Xavier's College,</i> West Bengal Board of Higher Secondary Examination Higher Secondary Examination, Graduated with 76% marks | Calcutta, INDIA |
| AWARDS | 2006 | Recognition for high standards of research and collegiality by the Reproductive Research Center, Cleveland Clinic Foundation, Ohio, USA | |
| | 2005 | Research Excellence Award from the Reproductive Research Center, Cleveland Clinic Foundation, Ohio, U.S.A. | |
| | 1997 | Medals and certificates awarded for obtaining highest marks in Surgery | |
| | 1997 | National Medical College Scholarships awarded for maintaining > 65% marks throughout medical curriculum. | |
| | 1992 | National talent Scholarship award for excellence in the Secondary Examination. | |
| PRESENTATION | 2006 | 62 nd Annual Meeting of American Society Of Reproductive Medicine, New Orleans, Louisiana | <p>Oral :</p> <ol style="list-style-type: none"> 1. Follicular viability in cryopreserved whole ovine ovary after transplantation with microvascular anastomosis 2. Evidence of revascularisation in cryopreserved whole ovine ovaries after transplantation <p>Poster :</p> <p>Protective effect of coincubating oocytes and antioxidants against oxidative stress induced alterations in metaphase-II mouse oocyte spindle</p> |
| | 2006 | Cleveland Society of Obstetricians and Gynecologists and Case Western Reserve University School of Medicine | <p>Oral:</p> <p>Oxidative stress induced alterations and protective effect of vitamin C in metaphase-II mouse oocyte spindle structure and chromosomal alignment</p> |
| | 2005 | Animal and Range Sciences, North Dakota State University | <p>Oral</p> <p>Effect of whole ovine ovary cryopreservation and transplantation with microvascular anastomosis</p> |

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| <p>2004-2006</p> <p>Reproductive Research Center, Cleveland Clinic Foundation</p> | <ol style="list-style-type: none"> 1. Female infertility – a clinical approach 2. Oxidative stress and Assisted reproduction Technology 3. Oogenesis – Abasic understanding 4. Oxidative stress and infertility 5. Recent advances in research in female infertility |
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REFERENCES

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 Staff, Glickman Urological Institute & Dept. Obstetrics & Gynecology
 Mail Code-A-19.1
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