PROCEEDINGS
The First Congress of
SEAVSA
(South East Asia Veterinary School Association)
Animal Health & Production
for Better ASEAN Quality of Life
Challenge of Veterinary Education

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Organizing Committee

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FOREWORD

World Organization of Animal Health (OIE) held an international conference among Dean of veterinary school in Paris, on October 2009. One of the results of the conference was to recommend that every nation or region constitute an institution of veterinary certification devoted in improving the integrity and collaboration among the nations in a region. Refer to the recommendation, veterinary school in South East Asia found an association called “South East Asia Veterinary School Association-SEAVSA”. This association declared on December 7, 2009 in Putra Jaya Malaysia.

To initiate global challenge in veterinary perspective, the SEAVSA successfully recognized their essential influences in improving veterinary services and contributing to the world. Throughout a comprehensive collaboration among veterinary school across South East Asia region, this organization conducted a congress. Faculty of Veterinary Medicine, Bogor Agricultural University has the honor to hold the first agenda of SEAVSA, the First Congress of SEAVSA “Animal Health and Production for Better ASEAN Quality of Life - Challenge of Veterinary Education”. Four main topics related to the main theme are veterinary education and profession, biodiversity and biomedical research, public health, zoonoses and food safety, animal health, ecohealth and animal production.

From this congress, we have achieving veterinarians, professional, and researcher from related field to communicate their ideas and wealth of knowledge and proposing emerging issues through scientific papers compiled in this proceedings.

Finally, from this congress we hope that SEAVSA can improves their integrity in understanding the new scope of activities and obligations facing them, and collectively embrace a common theme or central discipline that unifies the profession to and create an identify for the public they serve.

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EFFECT OF INHIBIN B ON MOTILITY OF RAT SPERM: A DEVELOPMENT OF PEPTIDE MALE HORMONAL CONTRACEPTION

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Keywords: Inhibin B, FSH, Sperm Motility, Male Hormonal Contraception.

Introduction

Despite currently available contraceptives, the world's population exceeds 6.5 billion and is increasing by 75 million yearly (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, 2007). Overpopulation continues to be a significant contributor to environmental degradation and human suffering worldwide. Scientists and activists alike point to the accelerating environmental impacts that population pressures have caused, including global warming from the developed world and hunger and disease in less developed areas. Moreover, almost half of all pregnancies are still unwanted or unplanned. Clearly, there is a need for expanded, reversible, contraceptive options. Multicultural surveys demonstrate the willingness of men to participate in contraception and their female partners to trust them to do so (Page et al., 2008). As there are limitations to current methods of male contraception, research has been undertaken to develop hormonal contraceptives for men (Amory et al., 2006). Recent international clinical research efforts have demonstrated high efficacy rates (90–95%) for hormonally based male contraceptives (Page et al., 2008).

Male Hormonal Contraception (MHC) exploits the classic endocrine feedback loop to suppress spermatogenesis (Matthiessen and McLachlan, 2006). Male Hormonal Contraception aims primarily to achieve reversible suppression of sperm output to reduce the number of ejaculated sperm to levels that reliably prevent fertilization (Handelsman, 2000). The goal of MHC is the reversible suppression of spermatogenesis to a level compatible with infertility (Anonymous, 2007).

Inhibin B is a testicular polypeptide hormone responsible for the negative feedback regulation of FSH secretion in men (De Kretser et al., 2000). Inhibin B is secreted by Sertoli cells in response to FSH and is the major feedback regulator of FSH secretion in man. The serum inhibin B level has emerged as a good marker of spermatogenesis and Sertoli cell function (Pierik et al., 2001). Study of van Mierop-Eminian et al. (1989) showed that treatment with a partially purified inhibin preparation from rat seminal cell-conditioned medium (rSCCM) during 4 days caused a significant decrease in the numbers of KL, intermediate, B1, and B2 spermatogonial to 90%, 87%, 68%, and 93% of the control values, respectively.

Materials and Methods

Twenty-four of 4 months males rat were randomly divided into four treatment groups (KO, KI, KII, KIII), each comprising 6 rats. Group KO was control group, while groups KI, KII, KIII were injected subcutaneously with inhibin B of 32 kDa in doses of 25, 50, 100 pg/rat, respectively. Rats were injected 5 times with time interval 12 days during 48 days. In the first injection, inhibin B mixed with 0.05 ml phosphate Buffer Saline (PBS) and was emulsified with 0.05 Complete Freund's Adjuvant (CFA), while in the control group, the male rats were only injected with 0.1 PBS without inhibin B (0 pg). In the second and fifth injection were done by inhibin B in 0.05 ml PBS and was emulsified with 0.05 Incomplete Freund's Adjuvant (IFA) (Wahyuningsih et al., 2004). Six days after last injection days, all rats were sacrificed and sperm were collected via cauda of ductus epididymis. Sperm motility was observed under microscope.

Results and Discussion

Inhibin B induced rats with various doses showing the significantly different of sperm motility (Table 1). Table 1 shows the effect of 32 kDa inhibin B injection with various doses showing different response of sperm motility. Injection of 32 kDa inhibin B significantly decrease of sperm motility between the groups and control (P<0.05). The decrease of sperm motility in this research, related with the decrease of serum FSH concentration (data not shown). FSH is a critical hormone regulator of gonadal function that is secreted from the pituitary gonadotrope cell (West et al., 2004) and plays a primary role in the control of spermatogenesis (Wolfgang et al., 2001). FSH acts directly on the Sertoli cells to stimulate germ cell
number and acts indirectly to increase androgen production by the Leydig cells (O’Shaughnessy et al., 2010). The analysis of sperm motility plays a central role in the evaluation of male fertility, as it is known that a high percentage of poorly motile or immotile sperm will not be able to fertilize (Baccetti et al., 2001; Chemes and Rawe, 2003).

Table 1. Profile of Rat Sperm Motility After Injection with Inhibin B of 32 kDa

<table>
<thead>
<tr>
<th>Group</th>
<th>R</th>
<th>Sperm Motility</th>
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<tbody>
<tr>
<td>KO</td>
<td>6</td>
<td>69.1667 ± 2.31661³</td>
</tr>
<tr>
<td>KI</td>
<td>6</td>
<td>44.8333 ± 3.31160⁶</td>
</tr>
<tr>
<td>KII</td>
<td>6</td>
<td>39.5000 ± 4.27785⁷</td>
</tr>
<tr>
<td>KIII</td>
<td>6</td>
<td>30.5000 ± 3.50714²</td>
</tr>
</tbody>
</table>

Figure 1. Mean of sperm motility after injection with inhibin B of 32 kDa

Semen analyses remain an essential component of infertility evaluation. Normal semen quality is usually based on World Health Organization (WHO, 1999) criteria for multiple seminal parameters, including seminal volume, pH, sperm concentration, motility, and morphology. The WHO criteria for normality of sperm motility is 50% or more, with forward progression within 60 minutes of ejaculation. Given these criteria, many laboratories might not check sperm motility > 1 hour. Bongso et al. (1998) suggest that sperm motility is an important factor in the fertilizing potential of the sperm, and motility has been shown to correlate closely with fertilization rates of human oocytes in vitro.

Conclusion

Based on the data, injection of 32 kDa inhibin B could decrease the decrease of sperm motility related to the decrease of serum FSH concentration. Sperm motility plays a central role in fertilizing the oocyte.


