Effect of Addition of Oxytocin in Preserved Semen at the Time of Insemination on Fertility

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ABSTRACT:
A total of 124 pigs were inseminated comprising 32, 35 and 57 female pigs using preserved semen added with 5 IU oxytocin, 10 IU of oxytocin (Syntocinon Inj. 5iu/ml. Novartis Pharma) and no Oxytocin (control) respectively. The farrowing rate was 65.60, 68.57 and 64.90 per cent in the three groups of pigs respectively. The effects of addition of oxytocin in preserved semen before insemination on fertility rate were found to be non-significant. The mean litter size in sows inseminated with preserved semen added with 5 and 10 i.u. oxytocin and without addition of oxytocin (Control) was 7.86 ± 0.33, 8.00 ± 0.37 and 7.84 ± 0.25 respectively. The effect of addition of oxytocin prior to insemination on litter size was found to be non-significant. This study revealed that the addition of oxytocin to the semen at the time of insemination had no significant effect on farrowing rate and litter size in sows.

Key words: Oxytocin, farrowing rate, litter size, insemination.
Oxytocin was supposed to increase uterine contraction improving the sperm cells transport thus allowing the establishment of an adequate oviductal sperm reservoir if it was added at the time of insemination. It might also induce the endogenous PGF$_2$α production (and vice versa) and it was likely that both the hormones would advance the onset of ovulation and so would result in a better synchronization between insemination and ovulation resulting in better fertility. However, conflicting reports were given by earlier workers. This study was carried out to investigate the effect of addition of Oxytocin in preserved semen at the time of insemination on fertility in sows.

MATERIALS AND METHODS
Semen was collected twice a week from seven LWY boars by gloved hand technique (Hancock and Hovell, 1959) using a dummy as mount as per the routine programme of semen collection in Artificial Insemination Centre, Selesih, Aizawl, Mizoram. Semen collections were made in the morning from 6.00 to 7.00 AM. from one or two boars per
collection day. The boar was brought to the semen collection site and was allowed to mount over the dummy. Good quality semen was extended in Beltsville Thawing Solution (BTS) keeping 4 billion sperm per insemination in 100 ml volume. The diluted semen was packed in cotchettes and stored at 18°C in BOD incubator. Preserved semen was used within three days of storage. Artificial insemination (A.I.) was done using sponge tip ‘Golden pig’ catheter.

A dose of 5 and 10 IU Oxytocin (Syntocinon Inj. 5iu/ml. Novartis Pharma) were added to the preserved semen just before insemination. A total of 124 pigs were inseminated comprising 32, 35 and 57 female pigs using preserved semen added with 5 IU oxytocin, 10 IU of oxytocin and no oxytocin (control) respectively. The farrowing rate and litter size at birth were recorded.

RESULTS AND DISCUSSION

The effects of addition of different doses of oxytocin in the preserved semen at the time of insemination on farrowing rate in pigs are presented in Table 1.

A total of 32 and 35 oestrous pigs were inseminated with preserved semen in which Oxytocin @ 5 and 10 i.u per dose respectively was added at the time of insemination. Fifty seven oestrous pigs (Control) were inseminated without oxytocin. The farrowing rate was 65.60, 68.57 and 64.90 per cent in the three groups of pigs respectively. The farrowing rate recorded with 5 and 10 i.u. oxytocin in the present study was comparable with the reports of Baranov and Vysotskii (1971) and Kudlac et al. (1978). But the present findings were lower than the reports of earlier workers (Sergeev, 1963; Schlegel and Loebel, 1972; Konig et al., 1975; Huhn et al., 1977 and Krajnak, 1988).

The effects of addition of oxytocin in preserved semen before insemination on fertility rate were found to be non-significant (Table 1). This was in agreement with the findings of Baker et al. (1968), Baranov and Vysotski (1971), Huhn et al. (1977) and Tarocco (2002). On the contrary, improved farrowing rate with addition of oxytocin at the time of insemination was reported by earlier workers (Sergeev, 1963; Schlegel and Loebel, 1972; Konig et al., 1975; Krajnak, 1988; Flowers, 1996 and Kirkwood, 1999). However, Flowers and Esbenshade (1994) reported that response to addition of oxytocin in semen on farrowing rate was variable. Levis (2000) reported that the addition of 4-5 IU of oxytocin to semen immediately prior to use improved farrowing rate in warm seasons but not during cool or moderate months. The climatic condition of Mizoram where the present study was carried out was moderate in all seasons of the year. This might be the reason for not getting significant improvement in farrowing rate after addition of oxytocin in the inseminate dose.

The mean litter size in sows inseminated with preserved semen added with 5 and 10 i.u. oxytocin and without addition of oxytocin (Control) was 7.86 ± 0.33, 8.00 ± 0.37 and 7.84 ± 0.25 respectively (Table 2). The effect of addition of oxytocin prior to insemination on litter size was found to be non-significant. This was in agreement with the finding of Huhn et al. (1977), Kudlac et al. (1978) and Tarocco (2002). The non-significant effect of addition of oxytocin to the semen at the time of insemination on farrowing rate and litter size might be because the contraction of adequately stimulated uterine horn of sow produces a natural secretion of oxytocin (Tarocco, 2002). This study revealed that the addition of oxytocin to the
semen at the time of insemination had no significant effect on farrowing rate and litter size in sows.

Table 1: Effect Of Addition Of Different Doses Of Oxytocin In The Preserved Semen At The Time Of Insemination On Farrowing Rate In Female Pigs

<table>
<thead>
<tr>
<th>Oxytocin doses</th>
<th>No. of sows inseminated</th>
<th>No. of sows Farrowed</th>
<th>Farrowing rate (%)</th>
<th>Chi-Square value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 IU</td>
<td>32</td>
<td>21</td>
<td>65.60</td>
<td></td>
</tr>
<tr>
<td>10 IU</td>
<td>35</td>
<td>24</td>
<td>68.57</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>57</td>
<td>37</td>
<td>64.90</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>124</td>
<td>82</td>
<td>66.13</td>
<td></td>
</tr>
</tbody>
</table>

NS Non significant

Table 2: Effect Of Addition Of Different Doses Of Oxytocin In The Preserved Semen At The Time Of Artificial Insemination On Litter Size In Female Pigs

<table>
<thead>
<tr>
<th>Oxytocin dose (IU)</th>
<th>No. of farrowing</th>
<th>Litter size</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean ± SE</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>21</td>
<td>7.86 ± 0.33</td>
<td>5 - 11</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>8.00 ± 0.37</td>
<td>4 - 11</td>
</tr>
<tr>
<td>Control</td>
<td>37</td>
<td>7.84 ± 0.25</td>
<td>4 - 11</td>
</tr>
</tbody>
</table>

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REFERENCES


