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Platinum Priority – Sexual Medicine

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Occlusion of Seminal Vesicles Increases Sexual Activity in a Mouse Model

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Abstract

Background: Little is known about the physiologic role of seminal vesicles beyond their fertility function. It has been suggested repeatedly that seminal vesicles have an impact on sexual activity. Although this has been investigated in various animal models, such a role has never been found.
Objective: To assess in a novel mouse model whether occlusion of seminal vesicles affects sexual activity.
Design, setting, and participants: Adult male CD1 mice (n = 77) were assigned randomly to the experimental groups: (1) seminal vesicle occlusion (SVO) (n = 24), (2) seminal vesicle resection (SVR) (n = 23), and (3) sham operation (SO) (n = 30). Adult females were brought into estrus by the Whitten effect. After recuperation, mouse pairs were observed during sessions of 3 h each. Sexual activity was analyzed separately by three observers blinded to the experimental conditions.
Intervention: SVO, SVR, and SO.
Outcome measurements and statistical analysis: The primary end point was percentage of sessions with intromission; secondary end points were number of intromissions and latency until first intromission. A logistic regression model and the Kruskal-Wallis test were used.
Results and limitations: A total of 141 sessions for a total of 423 h were analyzed. Intromission was scored in 20 of 42 sessions (48%) with SVO mice, a significantly higher rate than the 8 of 39 sessions (21%) with SVR mice (p = 0.001) and 18 of 60 sessions (30%) with SO mice (p = 0.004). Secondary end points were comparable in all three groups (p = 0.303 and 0.450, respectively).
Conclusions: Males with SVO were significantly more often sexually active than males undergoing SVR or SO. This suggests that occluded, and thus engorged, seminal vesicles increase sex drive in male mice. Since the potential clinical benefit might be highly relevant, further studies should confirm these promising results and investigate the potential application in men.

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1. Introduction

Seminal vesicles were first described in 1561 by the Italian anatomist Gabriel Fallopius. In the late 19th century, they became the focus of considerable interest because of their involvement in inflammatory diseases such as tuberculosis and gonorrhea [1]. At that time, however, their physiologic role was still not entirely understood.

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Table 1 – Summary and comparison of previous animal experiments investigating potential relationships between genital organs and sexual activity*

	Pauker [4]	Beach and Wilson [5]	Lawson and Sorensen [6]	Larsson and Swedin [7]	Tisell and Larsson [8]	Chow et al. [9]
Animal model	Golden hamster *(Cricetus auratus)*	Rat (Long-Evans)	Albino rat (Holtzman)	Rat (Wistar)	Rat (Wistar)	Golden hamster (*Mesocricetus auratus*)
Age of animals	11 wk	Adult	Not specified	5 mo	5 mo	8–10 wk
Male/female sexual experience	Not specified	Sexually experienced	Sexually experienced	High level of sexual activity	High level of sexual activity	Sexually experienced
Female priming	Hormonal injection (estradiol plus progesterone)	Hormonal injection (estradiol plus progesterone)	Not specified	Hormonal injection (estradiol plus progesterone)	Hormonal injection (estradiol plus progesterone)	Females considered as receptive by observation
Day/night cycle, illumination	Not specified	Not specified	Not specified	Reversed day/night cycle, observation in dark phase	Not specified	Red-light illumination; observation in dark phase
Recuperation time after surgery	3 d and 7 d, respectively	1 mo	28 d	Not specified	3–4 wk	3 wk
Time to male adaptation in apparatus	5 min	Not specified	Not specified	Not specified	5 min	None (home cage of male)
Observation duration	10–20 min	≥30 min	12 d (two estrus cycles)	Until ejaculation	≥30 min	15 min
Experimental groups	1. Resection of seminal vesicles and prostate ($n = 6$) 2. Castration 39 d after ($n = 6$, same males) Comparison with castrated males ($n = 4$) used in a previous investigation	Resection of seminal vesicles ($n = 10$)	Experiment 1 ($n = 8$) 1. Resection coagulating glands 2. Nonoperated males Experiment 2 ($n = 6$) Resection of coagulating glands	Resection of coagulating glands 1. Only ($n = 6$) 2. Plus preganglion hypogastric denervation ($n = 4$) 3. Plus preganglion hypogastric denervation ($n = 5$) plus postganglion hypogastric denervation 4. Plus resection seminal vesicles ($n = 4$) plus resection ventral prostate lobe plus preganglion hypogastric denervation	1. Resection seminal vesicles ($n = 9$) plus ventral/dorsolateral prostate plus coagulating glands 2. Sham operation ($n = 9$)	1. Resection of ampullary glands ($n = 7$) 2. Resection of coagulating glands ($n = 6$) 3. Resection of dorsolateral prostate ($n = 6$) 4. Resection of seminal vesicles ($n = 7$) 5. Resection of ventral prostate ($n = 8$) 6. Resection of accessory sex glands ($n = 7$) 7. Sham operation ($n = 7$) 8. Nonoperated males ($n = 6$)
Study design	Observations before and after resection of seminal vesicles and prostate, and after castration	Pre- and postoperative observations	Exp 1: Postoperative observations Exp. 2: Pre- and postoperative observations	Pre- and postoperative observations	Postoperative observations	Postoperative observations
End points	1. Mounting 2. Rear mounting 3. Intromission 4. Latency time until first intromission	1. Latency time until first mounting 2. Latency time until first intromission 3. Mounting/intromission series before ejaculation 4. Postejaculatory interval	1. Litter size 2. Libido and mating activity 3. Evaluation of regeneration of coagulating glands	1. Mounting 2. Intromission 3. Latency time until first intromission 4. Latency time until first ejaculation 5. Postejaculatory interval	1. Latency time until first mounting 2. Latency time until first intromission 3. Latency time until first ejaculation 4. Postejaculatory interval 5. Number of mountings 6. Number of intromissions	1. Latency time until first intromission 2. Latency time until first ejaculation 3. Number of intromissions 4. Postejaculatory interval 5. Duration of ejaculations 6. Number of ejaculations
Results	No difference between pre- and postoperative copulatory frequency and latency time	Unchanged postoperative copulatory frequency and latency time but fewer intromissions until ejaculation	Unchanged litter size, libido, and mating activity in operated and nonoperated males. No regeneration of coagulating glands	No difference of copulatory frequency and latency time between all four groups except for postoperative increase of mount frequency	No difference of copulatory frequency and latency time between experimental and sham-operated males	No difference in copulatory frequency and latency time between experimental and sham-operated males