wave inversion prevented in 9/10 animals both the T-wave inversion and the BP rise (fig. 1B), both protective effects lasting 2–3 h.

In a 2nd group of 6 cats in which stimulation, presumably of the same site[8] resulted in the appearance of tall T-waves and in a 50 ± 10 mm Hg increase in BP (fig. 2A), the same treatment with 10 units of oxytocin prevented both the ECG and BP changes in 3 out of 6 animals (fig. 2B). These protective effects also lasted about 2–3 h. The hemodynamic effects of the oxytocin administration per se were a small increase in BP in about 50% of the animals, with no effect on ECG or heart rate. In all cases the time-course of the protection against the ECG changes paralleled that of the protection against the pressor effect; the effects on both lasted 2–3 h.

Control animals (4 animals) that did not receive oxytocin protection did not show such a reduction of the effects upon receiving the same number of stimulations. We conclude therefore that the protection against the above-mentioned autonomic disturbances of central etiology was due to oxytocin.

In previous work we showed that the ECG changes and BP alterations could be induced independently of one another by LH stimulation. By varying the stimulus conditions we were able to discriminate between the two effects. Yet the protective effects of oxytocin on ECG and on the BP changes ran in parallel and were equally potent against parameters. This contrasted with the effects of the β-adrenoceptor blocking agents which blocked the ECG changes at half the dosage necessary to prevent BP changes[6]. Oxytocin is known to have peripheral actions on the heart and on blood vessels[11], as well as central actions[7]. However, we have no evidence for exogenous oxytocin gaining access to the hypothalamus or to related CNS regions, which would support the argument for a central mechanism of action.

1 The authors are indebted to the Roboz Surgical Instrument Co. Inc. of Washington, D.C. for support of this research and to M. Farchi for proficient technical assistance.

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0014-4754/83/121349-03$1.50 + 0.20/0

Effects of submandibularectomy and castration on thymus and spleen weights in male mice

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May 5, 1983

Summary. Submandibular-sublingualectomy of male mice did not result in thymic hyperplasia or potentiate the thymic hyperplasia which occurs after castration. Hemagglutination titers to sheep red blood cells were similar in immunized sham operated and submandibular-sublingualectomized mice but significantly less than titers in castrated mice.

Submandibularectomy of male mice is reported to result in significant thymic hyperplasia 28–40 days later[2,3]. In the present study, the effect of submandibularectomy on the thymic hyperplasia which normally follows castration of mice[4] was investigated. Additionally, the effects of submandibularectomy and castration on the antibody response to sheep red blood cells were evaluated.

Materials and methods. Male Swiss mice were purchased from Southern Animal Farms, Prattville, Alabama, USA. Mice were housed in shoebox plastic cages on hardwood bedding under controlled temperature, humidity, and light cycles and offered Purina rodent chow and tap water ad libitum.

Operations were performed under ether anesthesia and consisted of extirpation of submandibular-sublingual glands (SMX) through a ventral neck incision, gonadectomy (GX) through a mid-scrotal incision, or blunt neck dissection as a sham operation (SH). Vascular supply was not ligated prior to organ excission; bleeding occurred, but was well tolerated. Four Series of mice, consisting of 4 groups each, received the operations described. All remained untreated except for Series 2 which was injected with 1×10^8 sheep red blood cells (SRBC) i.p. on day 28 after surgery. Mice were sacrificed 30–42 days after surgery by cardiac puncture under ether anesthesia. Serum was collected and stored at −20 °C.

The thymus and spleen were removed at sacrifice, fixed in 10% formalin, cleaned of fascia and fat, weighed to the nearest 0.1 mg on a Mettler balance, and expressed as a percent of body weight. For antibody titration, sera was heated to inactivate complement, then diluted with saline 1:10 initially, and 1:2 thereafter. 100 µl of 2% 4 times washed SRBC suspension was added to 100 µl of diluted sera, incubated for 30 min in a 37 degree water bath, centrifuged, and gently agitated to determine if the cells went freely into suspension. The highest dilution giving visible agglutination was taken as titer and expressed as $\log_{10}$.

Results. Gonadectomized (GX) and submandibularectomized-gonadectomized (SMXGX) mice of all 4 Series had significant thymic hyperplasia compared to non-castrates (table). In Series 1, the combined operation (SMXGX) resulted in a potentiation of the thymic hyperplasia which occurred after only castration. However, this effect was not

Thymus and spleen relative weights and hemagglutination titers to SRBC in sham operated (SH), submandibularectomized (SMX) and gonadectomized (GX) mice

Organ	(1) SH	(2) SMX	(3) GX	(4) SMXGX	Significance at $p = 0.05$ or less
Series 1 (30 days)					
Thymus	0.2213 (11)	0.2500 (10)	0.3590 (10)	0.4494 (12)	4 > 3 > 2.1
% b.wt	0.0470	0.0447	0.0528	0.0587	
Spleen	0.2372 (11)	0.2298 (10)	0.3242 (10)	0.3341 (12)	4.3 > 1.2
% b.wt	0.0264	0.0323	0.0630	0.0477	
Series 2 (33 days)					
Thymus	0.1612 (8)	0.1672 (11)	0.3030 (10)	0.3171 (12)	4.3 > 2.1
% b.wt	0.0354	0.0281	0.0536	0.0900	
Spleen	0.2967 (8)	0.3099 (11)	0.4123 (10)	0.4200 (12)	4.3 > 2.1
% b.wt	0.0352	0.0370	0.0827	0.0944	
Hemagglutin	2.294 (10)	2.340 (11)	2.906 (9)	2.532 (11)	3 > 4.2.1
titer $\log_{10}$	0.346	0.527	0.368	0.250	
Series 3 (40 days)					
Thymus	0.1224 (14)	0.1554 (12)	0.2482 (11)	0.2534 (11)	4.3 > 2.1
% b.wt	0.0307	0.0294	0.0275	0.0454	
Spleen	0.2844 (14)	0.2734 (12)	0.3245 (11)	0.3051 (11)	None
% b.wt	0.0476	0.0593	0.0748	0.0596	
Series 4 (42 days)					
Thymus	0.1059 (12)	0.1141 (13)	0.2422 (9)	0.2514 (8)	4.3 > 2.1
% b.wt	0.0293	0.0229	0.0438	0.0302	
Spleen	0.3921 (10)	0.2810 (13)	0.2996 (9)	0.2915 (9)	1 > 2.3.4
% b.wt	0.1046	0.0631	0.0751	0.0492	

Values given are means ± SD; ( ) indicates number of mice per group; days are intervals between surgery and sacrifice. Series 2 mice were immunized with SRBC 5 days before sacrifice.

constant throughout the Series. Significant splenic hyperplasia was inconsistently observed in castrated mice through the Series. Significant thymic hyperplasia did not occur in submandibularectomized mice in any series. Hemagglutination titers were similar in SH, SMX, and SMXGX mice, but elevated in GX animals of Series 2.

Discussion. In general, submandibular-sublingualectomy did not result in significant thymic hyperplasia, either when the operation was done alone or with castration. We cannot confirm reports of thymic hyperplasia 28–40 days after submandibularectomy[2,3]. However, our operation consisted of extirpation of both submandibular and sublingual glands rather than only submandibular removal as done by other authors.

Neither hemagglutination titers nor spleen relative weights were significantly different for immunized SH and SMX mice (Series 2, table). Mice submandibularectomized 8 weeks previously are reported to have a significantly low plaque forming cell response to SRBC[5]. Although our time interval is shorter, our results are not consistent with this observation. In summary, our data do not suggest an influence of the submandibular-sublingual glands on thymus and spleen weights or SRBC antibody response in the mouse.

1 Acknowledgment. This study was aided by NIDR grant 1F32 DE05305-01 to D. Dean.
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0014-4754/83/121351-02$1.50 + 0.20/0

Blood oxygen affinity in large white pig

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Summary. Large white pig and human blood oxygen affinities are different due to different primary structures of hemoglobin. Empirical equations are reported to predict the oxygen partial pressure at half-saturation of hemoglobin (p50) from known values for pH, pCO_2 and 2,3-diphosphoglycerate, with an accuracy of ± 0.82 torr.

Although the large white pig is frequently used in physiological studies, little is known at present about the oxygen carrying properties of its blood. The primary structure of pig hemoglobin differs from that of human HbA in the exchange of 22 amino acids for each chain[1,2]. Differences in the oxygen affinity between humans and pigs should be expected, because the changes involve the site of the reaction of hemoglobin with 2,3-diphosphoglycerate (2,3-DPG).

The aim of this work is to investigate the simultaneous