Effect of anoreceptive intercourse on anorectal function

A J G Miles MS FRCS **T G Allen-Mersh** MD FRCS **C Wastell** MS FRCS
Department of Surgery, Westminster Hospital, Page Street, London SW1 2AP

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Summary
This study is the first published assessment of the effect of anoreceptive intercourse (ARI) on anal sphincter tone and function. Forty anoreceptive (AR) male homosexuals were compared with 18 age matched non-anoreceptive (non-AR) heterosexual males. Subjects were questioned about ARI, defaecation and faecal incontinence. Anal resting pressure, maximum voluntary squeeze pressure, anal mucosal electrosensitivity, perineal descent and rectal sensation were measured in all subjects. Fourteen of the AR subjects but only one of the non-AR subjects had symptoms of frequent anal incontinence ($P<0.05$). There was a significant reduction in both maximum anal resting pressure ($P<0.01$) and anal mucosal electrosensitivity ($P<0.05$) and a significant difference in the anal resting pressure profile ($P=0.02$) in the AR subjects compared with the non-AR subjects. There was a significant reduction in maximum squeeze pressure in AR subjects with anal incontinence compared with either AR subjects without anal incontinence ($P<0.01$) or non-AR subjects ($P<0.01$). There were no significant differences in stool consistency, frequency of defaecation, perineal descent or rectal sensation between the groups. ARI is associated with reduced resting pressure in the anal canal and an increased risk of anal incontinence. The risk of incontinence is greatest amongst AR subjects with reduced maximum squeeze pressure.

Introduction
Male homosexuality is associated with an increase in anorectal disease[1], which is mainly a result of either sexually transmitted infection[2] or trauma[3]. We have also noted a greater tendency to perianal soiling amongst male homosexual patients seen for treatment of a variety of anorectal conditions. This could not be attributed to the presenting complaint and we wondered if it was a direct consequence of the repeated anal dilatation which occurs during anoreceptive intercourse (ARI). The aim of this study was to determine, in a group of males who gave a history of regular ARI but were free of anorectal disease, whether there were differences in bowel habit or anal continence compared with non-anoreceptive age-matched males. We went on to compare anal and rectal sensation, and anal sphincter function between the groups. Informed written consent was obtained from all the subjects involved in the study.

Correspondence to: Mr T G Allen-Mersh

Methods
Subjects
The term 'homosexual' refers to sexual preference rather than practice and, like the term 'buggery' makes no distinction between active or passive roles during ARI. Therefore we defined two subject groups for the study.

Anoreceptive (AR) Male homosexuals who gave a history of regular ARI. These 'AR-subjects' were recruited from the outpatient clinic of the department of genitourinary medicine. All patients were attending for routine follow-up and were free of anorectal disease at time of study.

Not anoreceptive (non-AR) The control subjects were age-matched heterosexual males who denied any form of ARI at any time. These 'non-AR subjects' were recruited from patients with no history of anal or rectal disease who were admitted for minor or intermediate surgery such as vasectomy or herniorrhaphy.

Pattern of anoreceptive intercourse
Anoreceptive subjects were asked:
(1) At what age did you first have ARI?
(2) With how many partners have you been anoreceptive?
(3) What is your average frequency of ARI per month at present?
(4) What forms of ARI do you practise; penile, artificial penile (dildo), brachioproctic (fisting) or others?

Bowel habit
All subjects were asked:
(1) How many bowel actions do you have per week?
(2) Is the usual consistency of your stool either hard, soft or liquid?
(3) Do you strain for greater than 50% of the time during defaecation?
(4) Do you have to defaecate immediately that you are aware of stool in the rectum in order to prevent incontinence of solid stool?
(5) Are you frequently incontinent of either solid stool, liquid stool or flatus?

Anorectal pressure and sensation
Anal sphincter resting pressure and maximum voluntary squeeze pressure were recorded by station pull-through at 1 cm intervals using a water filled micro-balloon system. All pressures were converted into standard units[4]. Perineal descent and anal mucosal electrosensitivity, were assessed as previously

described[5,6]. Rectal sensation was measured with a low compliance balloon inserted into the rectum and filled with warm water (37°C) at a flow rate of 60 ml/min. Volumes to produce the first constant sensation of rectal filling, recto-anal reflex relaxation, and an urgent need to defaecate were recorded. All measurements were made in triplicate. After use all non-disposable equipment was cleaned with detergent and immersed in 2% activated glutaraldehyde[7].

Electromyography

Pudendal nerve terminal latency (PNTL) was measured using a disposable pudendal nerve stimulator[8]. Motor unit fibre density of the external anal sphincter was measured by single fibre EMG[9].

Statistical methods

Differences in bowel habit and anal mucosal electrosensitivity were assessed by contingency table analysis. Differences in anal pressures and rectal sensation were assessed by Wilcoxon rank sum test. The anal resting pressure curves were compared by 2-way analysis of variance (2-way ANOVA) and least significant difference tests[10]. Correlation between anal resting pressure and numbers of partners was by calculation of Pearson's product-moment correlation coefficient and Fisher's z-transformation of r[11]. This data was expressed graphically (Figure 2) by the addition of a small constant and log transformation to allow for the wide variation of number of partners amongst the AR subjects.

Results

Fifty-eight subjects were recruited: 40 AR (mean age 33±10 years) and 18 non-AR (mean age 31±9 years). Twenty-three of the AR subjects were HIV-antibody positive, 16 HIV-antibody negative, and one had not been tested. No non-AR subject belonged to a high risk group for HIV infection and none had been HIV-tested.

Pattern of ARI

The mean age of onset of ARI in the AR group was 18.7±4.1 years with a median history of ARI of 12 years (range 2-26 years). The median number of partners since onset of ARI was 100 (range 1-1500) with a median frequency of ARI 2.5 episodes per month (range 1-90).

Continence

There was a significant (chi-squared=4.2, $P<0.05$) increase in the prevalence of incontinence to either flatus, liquid or solid stool or urgency requiring immediate defaecation to avoid incontinence in AR subjects (14/40) compared with non-AR subjects (1/18). There was no significant difference in bowel habit or stool consistency between AR and non-AR subjects.

Anal resting pressure

There was a significant reduction ($P<0.01$) in maximum anal resting pressue in AR subjects (median 4.3, range 1.3-11.6 kPa) compared with non-AR subjects (median 6.6, range 4.8-10.4 kPa). There was a significant difference ($P=0.02$) in the profile of anal canal resting pressure curve between the AR and non-AR subjects (Figure 1). There was a significant ($P<0.001$) negative correlation ($r=-0.6$) between maximum anal resting pressure and total number of partners (Figure 2). Maximum resting pressure was

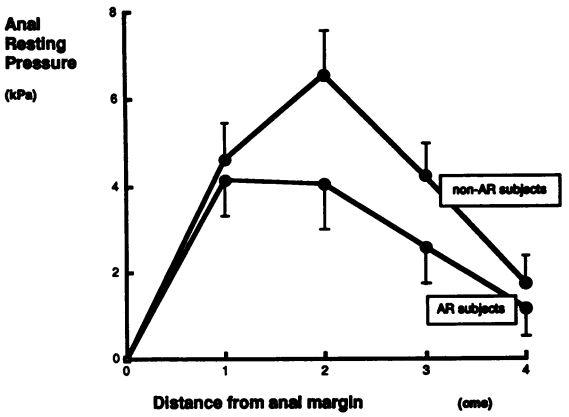

Figure 1. There was a significant difference in anal sphincter resting pressure profile (mean±SEM) for AR subjects compared with non-AR subjects (2-way ANOVA $P<0.0001$ within groups, $P<0.02$ between groups)

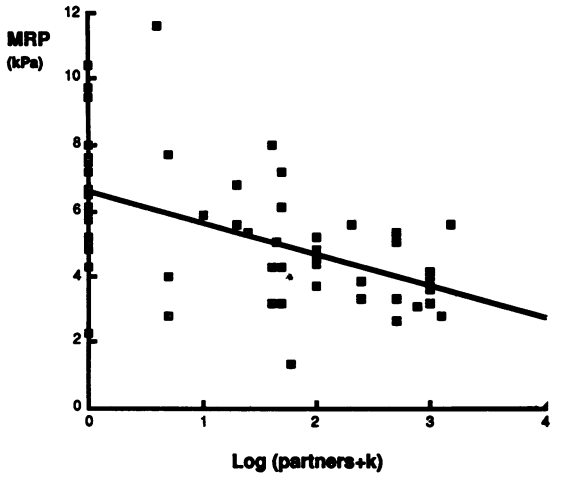

Figure 2. There was a significant negative correlation between anal canal maximum resting pressure and the total number of partners for whom the subject had been anoreceptive ($k=1$, $r=-0.624$, Fisher's z-transformation $P<0.01$)

significantly ($P<0.05$) lower in AR subjects with anal incontinence (median 3.4, range 1.3-11.6 kPa) compared with continent AR subjects (median 4.6, range 4.8-10.4 kPa). Maximum resting pressure was significantly ($P<0.01$) lower in AR subjects who practised brachioproctic intercourse (median 3.7, range 3.3-5.6 kPa) compared with AR subjects who denied brachioproctic intercourse (median 4.6, range 1.3-11.6 kPa). No significant differences were found in anal maximum resting pressure between HIV-antibody positive and HIV-antibody negative AR-subjects.

Anal squeeze pressure

Overall there was no significant difference between AR and non-AR subjects in anal maximum voluntary squeeze pressure (Table 1) but AR subjects who reported anal incontinence had significantly ($P<0.01$) lower maximum voluntary squeeze pressures (median 16.1, range 8.7-26.7 kPa) compared with AR subjects who denied anal incontinence (median 25.5, range 13.3-43.5 kPa).

Anal sensation

There was a statistically significant ($P<0.05$) reduction in anal mucosal electrosensitivity for AR subjects (median 2.0 range 1.0-5.0 mA) compared with non-AR subjects (median 1.5 range 1.0-4.0 mA) (Table 1).

Table 1. Maximum resting pressure, maximum squeeze pressure, perineal descent, anal and rectal sensation (median, range)

	Anoreceptive	*Not anoreceptive*	P
Maximum resting pressure (kPa)	4.3 (1.3-11.6)	6.6 (4.8-10.4)	<0.01**
Maximum squeeze pressure (kPa)	18.9 (8.7-43.3)	18.2 (10.7-46.0)	ns**
Perineal descent (cm)	0.6 (0.0-2.4)	0.6 (0.0-2.0)	ns*
Mucosal electrosensitivity (mA)	2.0 (1.0-5.0)	1.5 (1.0-4.0)	<0.05*
Minimum sensory volume (ml)	43 (13-133)	32 (12-185)	ns**
Recto-anal inhibitory reflex volume (ml)	17 (10-230)	23 (10-69)	ns**
Maximum tolerable volume (ml)	108 (38-500)	133 (47-183)	ns**

*contingency table analysis; **Wilcoxon rank sum test

There was no significant difference in anal mucosal electrosensitivity for AR subjects who reported anal incontinence compared with those who did not.

Rectal sensation

There was no significant difference between AR and non-AR subjects in volume of first constant sensation of rectal filling, volume to elicit recto-anal reflex or maximum tolerable rectal volume (Table 1). AR subjects who practised brachioproctic intercourse had significantly ($P<0.05$) greater maximum tolerable rectal volumes (median 373, range 48-500 ml) compared with AR subjects who denied brachioproctic intercourse (median 109, range 38-400 ml).

Electromyography

EMG measurements were performed in 14 AR subjects and five non-AR subjects. All five non-AR subjects and seven of the AR subjects were HIV-antibody test negative, four had asymptomatic HIV infection (CDC stage II) and two were symptomatic of HIV-infection (CDC stage IVa). Eight of the AR subjects had no incontinence, six reported frequent incontinence of either flatus, liquid stool or solid stool. PNTML were within the normal range[8,12] in all but one subjects. This one subject also had perineal descent and reported frequent incontinence of flatus. No significant difference (Wilcoxon test $P=0.08$) in motor fibre density of the external anal sphincter was observed between AR (median 1.6, range 1.2-2.0) and non-AR subjects (median 1.8, range 1.6-1.9) or between continent AR subjects (median 1.5, range 1.2-1.9) and incontinent AR subjects (median 1.8, range 1.2-2.0) (Wilcoxon test $P=0.09$).

Reflex anal dilatation[13] was not observed in any subject studied.

Discussion

This study has revealed an excess of minor anal incontinence amongst anoreceptive homosexual men. Over a third of AR subjects reported some degree of anal incontinence or urgency of defaecation. As with any questionnaire we cannot be sure that the questions were answered correctly but discussing the answers in a sympathetic manner within the confines of a secure and friendly environment must have increased the likelihood of accurate responses[14].

The internal anal sphincter has been shown to be responsible for 70% of the anal canal resting pressure[15]. Therapeutic manual dilatation of the anus is known to result in a reduction of anal maximum resting pressure[16] and minor defects of anal continence have been reported in 35% of patients following internal sphincterotomy[17]. Thus it is likely that trauma to the internal anal sphincter as a result of ARI is the cause of the reduced anal resting pressure in AR subjects.

The sphincteric dilatation of ARI is similar to that required to pass a large stool. However passage of stool through the anal canal is facilitated by reflex relaxation of the internal sphincter[18] and this protective mechanism may not be present during the forced dilatation of ARI[19]. Our results suggest that the more traumatic forms of ARI are more likely to damage the internal anal sphincter. The correlation between maximum resting pressure and estimated number of partners suggests that the damage to the internal sphincter is a cumulative effect. The observation that the risk of anal incontinence is greatest amongst AR subjects with a reduced maximum squeeze pressure is in keeping with findings in incontinent patients[5]. The reduction in anal mucosal electrosensitivity (MES) is statistically significant but its magnitude is unlikely to be responsible for the symptoms of incontinence reported by AR subjects. (The reduction in MES in patient groups with anal incontinence such as is found in diabetes mellitus is much greater[20,21] than was observed in the AR subjects in this study.) Furthermore those AR subjects with anal incontinence did not have lower MES than those who were continent.

Whilst we did not observe the reflex anal dilatation in adult anoreceptive subjects which has been proposed as a sign of ARI in children[13] the results of this study do provide grounds for concern that anal interference in children could result in reduced internal anal sphincter function.

In conclusion, anoreceptive intercourse is associated with reduced anal canal resting pressure and an increased risk of minor anal incontinence. It is unlikely that anoreceptive subjects will abstain from ARI because of a small risk of future anal incontinence, but the use of agents to relax the anal sphincters prior to penetration might reduce the risk of injury and subsequent incontinence.

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Forthcoming events

British Association of Oral and Maxillofacial Surgeons: Spring Meeting
31 March to 3 April 1993, Cardiff
Further details from: The Honorary Secretary, British Association of Oral and Maxillofacial Surgeons, Royal College of England, 35/43 Lincoln's Inn Fields, London WC2A 3PN (Tel: 071 405 8074; Fax: 071 430 9997)

Mediastinal Tumours
1-2 April 1993, London
Further details from: Postgraduate Education Centre, National Heart & Lung Institute, Dovehouse Street, London SW3 6LY (Tel: 071 351 8172; Fax: 071 376 3442)

Tinnitus and its Management
4-8 April 1993, Nottingham University
Further details from: Mrs Jean Willoughby, Course Administrator, c/o Institute of Hearing Research, University Park, Nottingham NG7 2RD

Trace Elements and Free Radicals in Oxidative Diseases
5-9 April 1993, Chamonix, France
Further details from: Professor A Favier/Mme A Alcaraz, Laboratoire de Biochimie C, Hopital A Michallon, BP 217X, 38043 Grenoble Cedex 09, France (Tel: 76 76 54 07; Fax: 76 42 66 44)

The Scientific Basis of Fetal Medicine
8 April 1993, London, UK
Further details from: Royal College of Obstetricians & Gynaecologists, 27 Sussex Place, Regent's Park, London NW1 4RG (Tel: 071 262 5425 ext 207)

Postgraduate Course in General Surgery
15-17 April 1993, San Francisco, USA
Further details from: Extended Programs in Medical Education, University of California, Room LS-105, San Francisco, CA 94143-0742, USA (Tel: 415 476 4251)

Cancer in the Female Pelvis: A Multidisciplinary Rendezvous
20-21 April 1993, London, UK
Further details from: (see entry for 8 April 1993)

7th British Knee Instability Course
20-23 April 1993, Oswestry
Further details from: Erica Wilkinson, Symposium Secretary, Institute of Orthopaedics, Robert Jones & Agnes Hunt Orthopaedic & District Hospital, Oswestry SY10 7AG (Tel: 0691 655311)

6th Annual Advanced Training Program in Biomedical Research Management
25 April-1 May 1993, Elsinore, Denmark
Further details from: Professor T Agersnap, Institute of Organization, Copenhagen School of Economics, Blaagaardsgade 23B, DK-2200 Copenhagen N, Denmark (Tel: 45 3315 0520 ext 15, Fax: 45 4286 7239)

Introduction to Commercial Drug Development
27 April 1993, London, UK
Further details from: Christine Bell, Rostrum, Lewis House, 1 Mildmay Road, Romford, Essex RM7 7DA (Tel: 0708 735191; Fax: 0708 734876)

26th Annual Advances and Controversies in Clinical Pediatrics
13-15 May 1993, San Francisco, USA
Further details from: (see entry for 15-17 April 1993)

ALA/ATS International Conference
16-19 May 1993, California, USA
Further details from: Maureen J O'Donnell, American Lung Cancer Association, 1740 Broadway, New York NY 10019-4374

Molecular Genetics in Hearing Impairment
18 May 1993, London, UK
Further details from: Office for Professional & Industrial Training, University Park, Nottingham NG7 1BR (Tel: 0602 792841; Fax: 0602 501717)

Neurosurgery Postgraduate Course: Intracranial Tumors - Modern Management
20-21 May 1993, San Francisco, USA
Further details from: (see entry for 15-17 April 1993)

9th Annual Current Issues in Anatomic Pathology
27-28 May 1993, San Francisco, USA
Further details from: (see entry for 15-17 April 1993)

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