

INTERNATIONAL REVIEW OF

PRO-LIFE OFFICE

FEB 24 1987

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Volume X, Number 4

Winter 1986

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The Mucus Symptom's Length and Subphases during the Fertile Age

Erik Odeblad et al.

A retrospective study on the length of the slippery mucus phase within the mucus symptom indicates that it decreases from the age of about 15 to the age of about 35 years. The total length of the mucus symptom has a small but uncertain tendency to decrease a little, and the length of the sticky mucus phase has a small but also uncertain tendency to increase a little. Several related factors are presently being studied.

Introduction

THE LENGTH of the mucus symptom is stated to be, on the average, about 6 days (J. Billings 1984, Brown et al. 1980). During the mucus symptom (M), the mucus is, at the beginning, sticky, tacky, pasty, viscid, and whitish-yellow (T), but changes to become wet, slippery, lubricative, more fluid and translucent (S) during the last part of the mucus symptom (Hilgers and Prebil 1979, E. Billings and Westmore 1980). This last quality persists until the last day of fertile mucus, the peak day. Figure 1 gives a schematic presentation of these circumstances. We now know (Odeblad et al. 1983) that the reason for these changes are as follows. The beginning of

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the mucus phase coincides with an increasing amount of L type mucus (L = loaf) being secreted from the cervix due to the rise of estrogenic hormones in circulating blood. The change in quality of the fertile mucus depends on additional secretion of S type mucus (S = string), starting to a significant extent when the estrogen levels become high. During the infertile days before and after the mucus symptom, the G type mucus dominates. (G type mucus is secreted during the corpus luteum phase and is thick, opaque, and not receptive for sperm.)

The biophysical properties of G, L, and S type mucus are quite different, and this also applies to the nuclear magnetic resonance shift (NMR shift) of the native mucus. This property can be measured with high precision. When such NMR shift measurements were compiled, it turned out that the time periods for S type mucus presence appeared to be longer in younger women than at higher age (Odeblad and Bergström, unpublished). We therefore undertook a retrospective study on the length of T and S phases of the mucus symptom in women of different ages.

Material and Methods

Records of menstrual periods (chartings and verbal records, written at the time of observation) were utilized. One hundred and seven (107) women fulfilling the following criteria were accepted in this study:

1. Age 13 to 37 years.
2. Regular ovulatory cycles by mucus recordings and, if performed, repeated pelvic examinations or hormone measurements.
3. Never had taken the Pill, never had an IUD.
4. The first infertile period of the cycles clearly distinguishable.
5. The beginning of the mucus symptom clearly marked on the records.
6. The change in mucus from T to S subphase clearly marked on the record.
7. The peak day clearly marked on the record.
8. The corpus luteum phase having persisted for at least 10 days, as evidenced on the chart or by pelvic or hormone

examinations.

9. Length of menstrual cycles between 23 and 35 days.
10. The woman should not have received treatment for any major gynecological disease.
11. The general health has been in good condition at the time of recording. A total of 132 cycles (some of the 107 women provided more than one cycle) allowed a study of the S phase, and a total of 126 cycles allowed a study of the M and T phases. The difference in number of cycles is due to the difficulty in unambiguously deciding on which day the M and T phases started.

Results and Conclusions

The results are illustrated in figures 2 and 3 and in tables I, II, and III. Figure 2 gives the individual values (length in days for M, T, and S phases) at different ages. (Visual inspection of the results indicates a possible decrease of the S phase length with increasing age (as suggested by the NMR measurements).

The women were divided into five equally long age groups (table I), and the average phase length and standard deviation were calculated for each phase and age group. The difference in phase length and the significances are presented in table II.

The linear regressions for the M, T, and S phases were also calculated and are presented in table III and in figure 3. The results indicated that the decrease with age of the slippery mucus phase is significant, but that the trends for the total mucus symptom (M) and the tacky mucus phase (T) are not significant but may indicate a tendency. Figure 3 is self-explanatory.

If all these results are brought together, they indicate that the number of days for persistence of the slippery mucus phase within the mucus symptom becomes shorter with increasing age, from about 6 days around the age of 15 to about 2 days at the age of 35 years.

The reasons for this reduction of the length of the slippery mucus phase are presently being studied in several ways. Presently the perimenopausal time and also several other factors are being investigated.

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TABLE I
DURATION OF MUCUS IN VARIOUS AGE GROUPS

AGE (YEARS)	S			T			M		
	n	M	σ	n	M	σ	n	M	σ
13-17	19	6.10	1.37	19	1.73	1.21	19	7.84	0.97
18-22	36	4.97	1.01	36	2.47	1.06	36	7.44	0.98
23-27	38	3.86	0.80	37	3.21	0.88	37	7.05	1.06
28-32	26	3.40	0.98	22	3.31	0.99	22	6.75	1.52
33-37	19	1.76	0.77	18	3.11	0.40	18	4.92	1.10

n = number of women
M = mean duration of days
 σ = standard deviation

TABLE II
DIFFERENCES AND SIGNIFICANCES BETWEEN AGE GROUPS

	13-17	18-22	23-27	28-32	33-37
M		0.40	0.79	1.09	2.93
13-17 T	—	0.74	1.48	1.58	1.37
S		0.35	0.34	0.38	0.18
M	o		0.39	0.69	2.53
18-22 T	o	—	0.74	0.85	0.64
S	oo		1.09	0.23	0.25
M	oo	o		0.30	2.14
23-27 T	ooo	oo	—	0.10	0.11
S	ooo	ooo		1.92	0.23
M	oo	o	o		1.83
28-32 T	ooo	oo	o	—	0.21
S	ooo	ooo	o		0.29
M	ooo	ooo	ooo	ooo	
33-37 T	ooo	ooo	o	o	—
S	ooo	ooo	ooo	ooo	

D

p

- p = Probability that figures are different
- o no significant difference (> 0.05)
 - o probably significant difference (0.01-0.05)
 - oo significant difference (0.001-0.01)
 - ooo highly significant difference (< 0.001)

D = Duration in days

Example: The mucus (M) duration is 2.93 days longer in the 13-17 age group than in the 33-37 age group.

TABLE III
 COEFFICIENTS OF CORRELATION (r) AND REGRESSION
 LINES FOR M, T, AND S PHASES

PERIOD	n	r	D ₀	k
MUCUS PHASE	126	-0.567	10.1	-0.13
PASTY TYPE SUBPHASE	126	0.443	0.9	+0.08
SLIPPERY TYPE SUBPHASE	132	-0.807	9.2	-0.21

n = number of cycles
 r = correlation
 k = coefficient of regression
 Regression line: Days = D₀ + k · age

A	Menstruation			Mucus Symptom M							Second Infertile Days							A											
B	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10	+11	+12	+13	+14	B
C				Fertile Days							Second Infertile Days							C											
	First infertile days																												
D	Menstruation			Basic infertile pattern							Basic Infertile Pattern							D											
				T Scanty Sticky Tacky Pasty Whitish Viscid							S Abundant Wet Slippery Lubricative Translucent Fluid-like																		
E				Prepeak							P							E											
F											X							F											
G	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	G

Fig. 1.

Rows:

- A = Main symptoms during the cycle (typical cycle at about 25 years of age). Note, M = the whole mucus symptom.
- B = Days related to ovulation, assumed to occur on day 14 in the menstrual cycle (row G).
- C = Fertility pattern. Fertile phase begins with the mucus symptom, ends 3 days after peak (row F).
- D = Detailed symptoms of the intermenstrual period. Note that the mucus symptom is subdivided into phases T ("tacky", mucus) and S ("slippery", mucus, by sensation). The basic infertile pattern can be of dryness or of mucus (Billings and Westmore, 1980, 1984).
- E = The subdivision of the mucus phase into prepeak and peak (P).
- F = The definition of days 1, 2 and 3 after peak. These days must be included in the fertile phase (row C).
- G = Days in the menstrual cycle (see also row A).

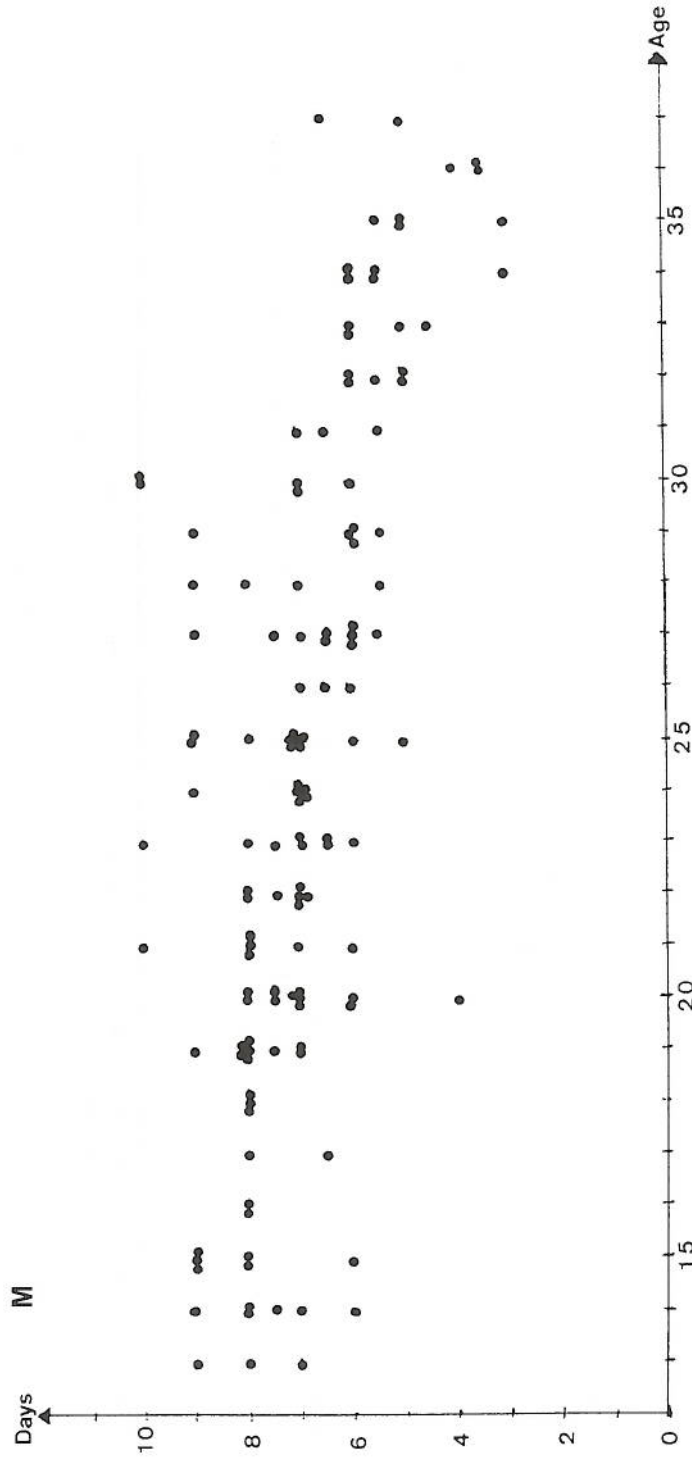


Fig. 2a. Individual values (length in days) for M phase.

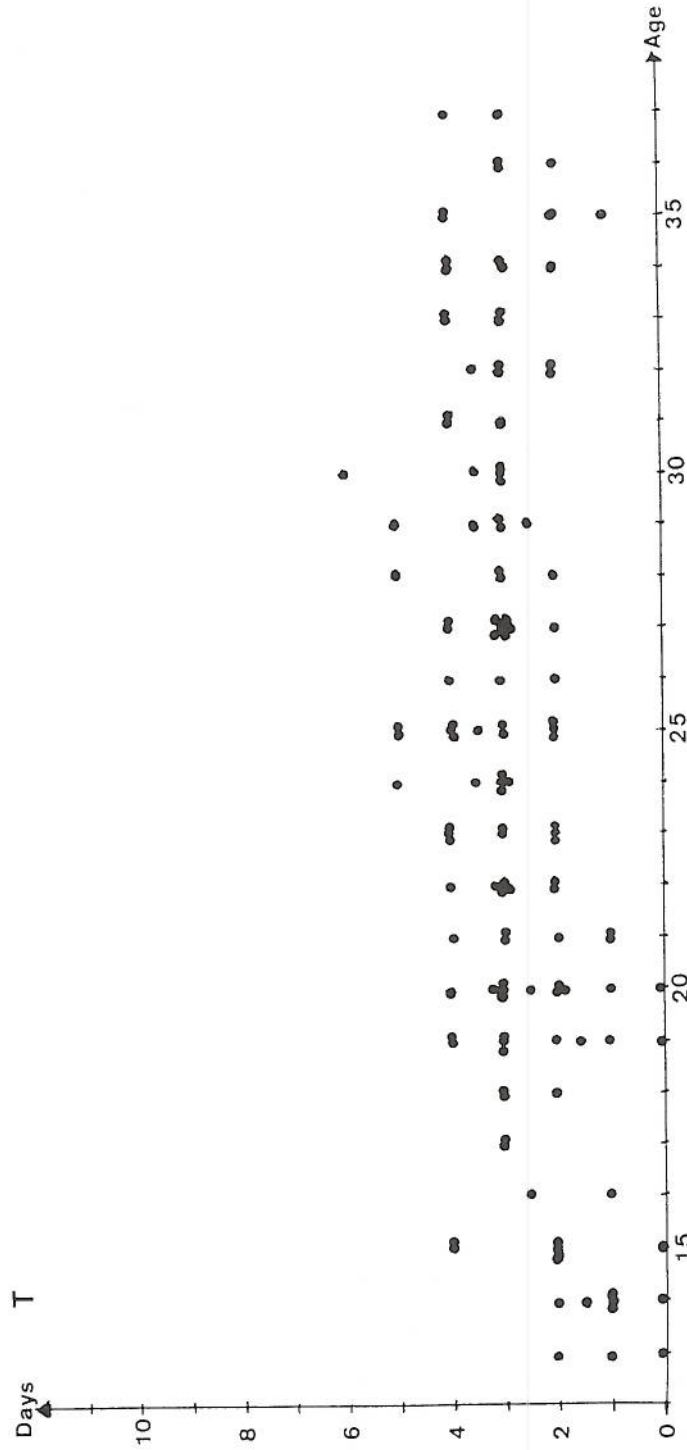
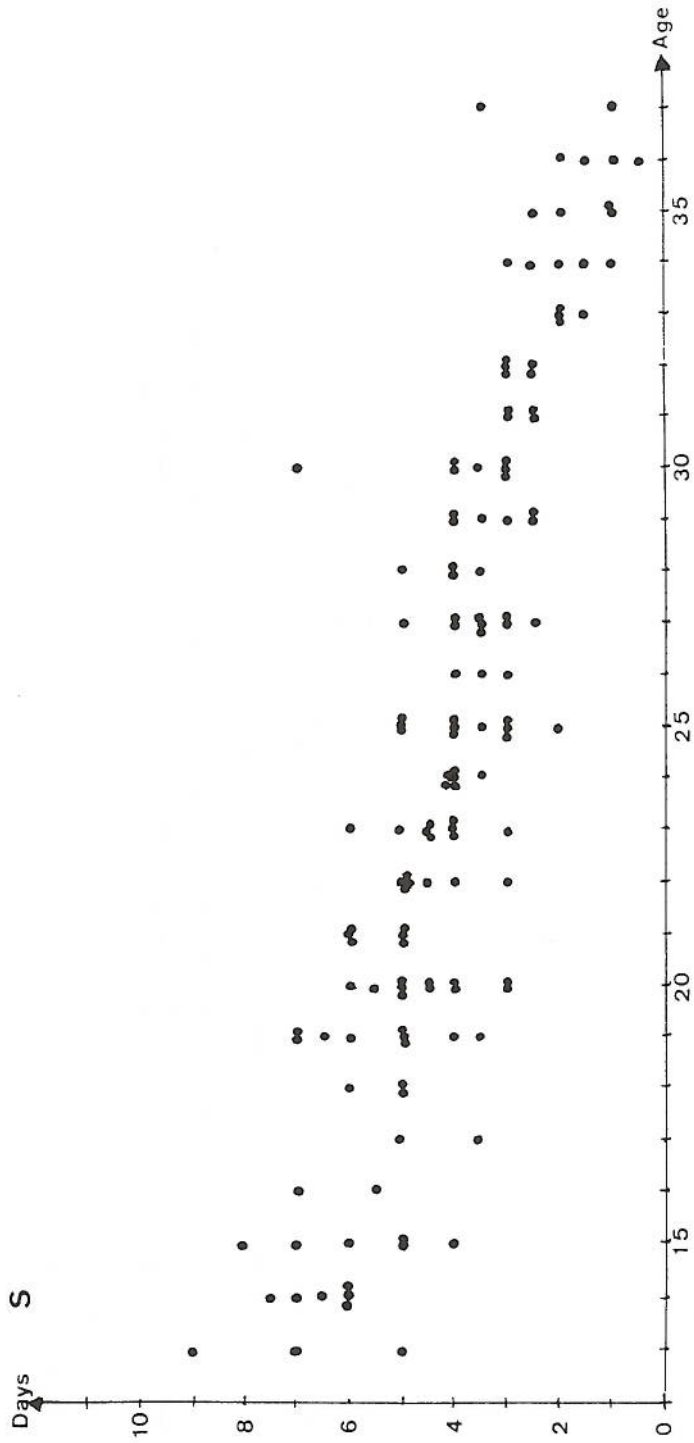


Fig. 2b. Individual values (length in days) for T phase.



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Fig. 2c. Individual values (length in days) for S phase.

Days ↑

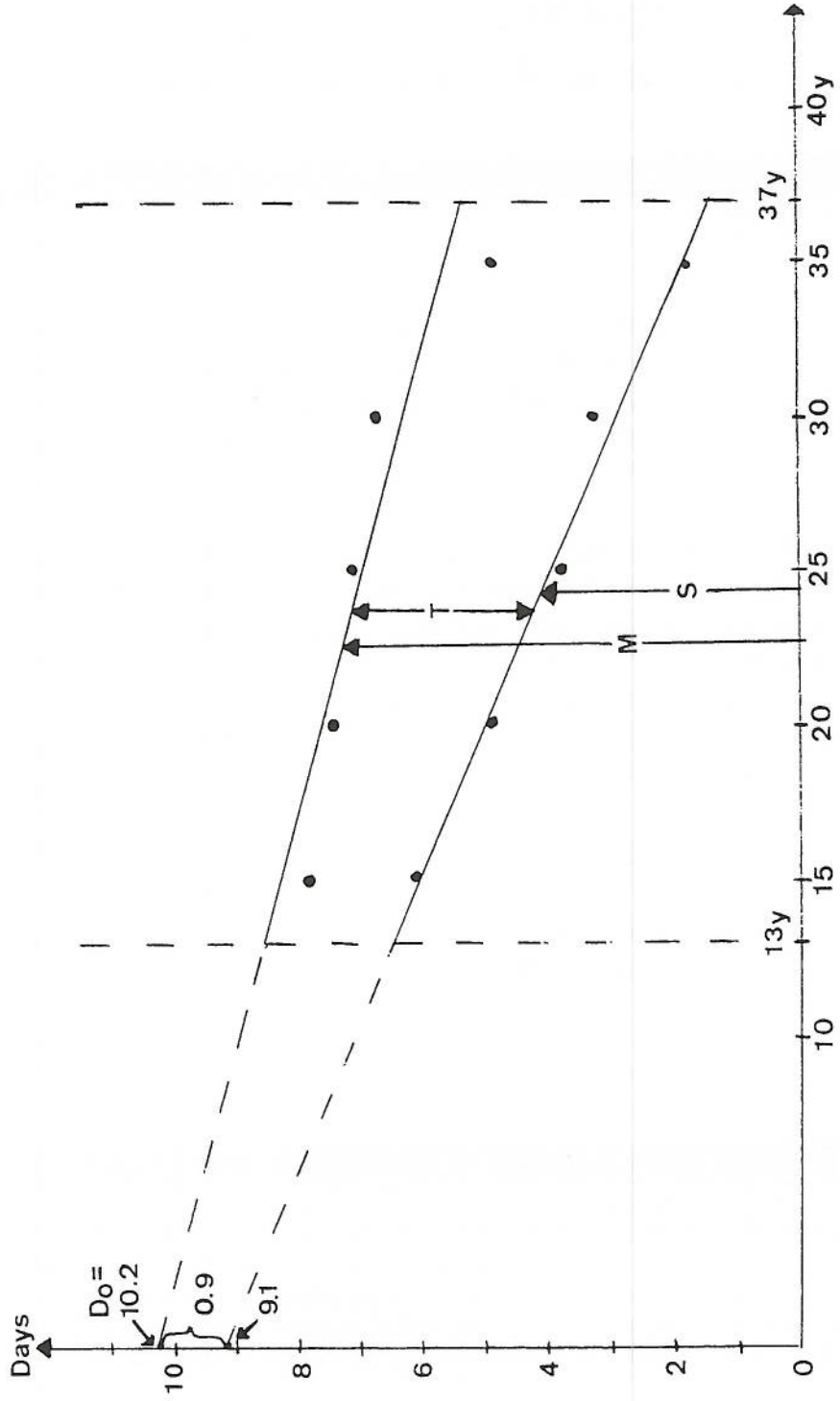


Fig. 2c. Individual values (length in days) for S phase.

Fig. 3. Linear regressions for the M, T, and S phases.