

Contents

A.	Introduction	1
B.	Origin of Human Amniotic Fluid	2
C.	Origin and Regulation of Steroids in Human Amniotic Fluid	5
D.	Methods of Isolation and Identification of Steroids in Human Amniotic Fluid	6
	I. C ₃₀ , C ₂₉ , and C ₂₈ Steroids	6
	II. C ₂₇ Steroids	6
	1. Cholesterol	6
	2. Cholestanol	6
	3. Δ^7 -Cholestenol and Δ^8 -Cholestenol.	6
	4. 7-Dehydrocholesterol and Desmosterol	6
	III. Δ^5 -C ₂₁ Steroids	7
	1. Pregnenolone	7
	2. 16 α -Hydroxypregnenolone.	7
	3. 17 α -Hydroxypregnenolone.	7
	4. Pregn-5-ene-3 β , 20 α -diol	7
	5. Pregn-5-ene-3 β , 17 α , 20 α -triol	7
	6. 21-Hydroxypregnenolone	7
	7. Pregn-5-ene-3 β , 20 α , 21-triol.	7
	IV. Δ^4 -C ₂₁ Steroids	8
	1. Progesterone.	8
	2. 16 α -Hydroxyprogesterone	8
	3. 17 α -Hydroxyprogesterone	8
	4. Cortisol	8
	5. 6 β -Hydroxycortisol	8
	6. 6 β , 20 β -Dihydroxycortisol.	9
	7. 11-Deoxycortisol	9
	8. 21-Deoxycortisol	9
	9. Cortisone	9
	10. 6 β , 20 β -Dihydroxycortisone	9
	11. Corticosterone	9
	12. 11-Dehydrocorticosterone	9
	13. 11-Deoxycorticosterone	10
	14. Aldosterone	10
	V. Pregnane Steroids	10
	1. Pregnanolone	10

2. Pregnanediol	10
3. 5 α -Pregnane-3 α , 20 α -diol and 5 α -Pregnane-3 β , 20 α -diol	11
4. 5 α -Pregnane-20-one-3 α , 21-diol	11
5. 5 α -Pregnane-20-one-3 α , 16 α -diol and 5 β -Pregnane-20-one-3 β , 16 α -diol	11
6. 5 β -Pregnane-20-one-3 α , 6 α -diol	11
7. Pregnanetriol	12
8. 5 α -Pregnane-3 α , 20 α , 21-triol	12
9. 5 α -Pregnane-3 β , 16 α , 20 α -triol	12
10. Tetrahydrocortisol, Tetrahydrocortisone, and Tetrahydro-11-dehydrocorticosterone	12
11. Tetrahydro-11-deoxycortisol	12
12. 6 α -OH-Tetrahydrocortisol, 6 α -OH-Tetrahydrocortisone, 6 α -OH-Allotetrahydroxycortisol, 6 α -OH-Allotetrahydroxycortisone, 6 α -OH-20 α -Cortolone, and 6 α -OH-20 β -Cortolone	13
VI. Δ^5 -C ₁₉ Steroids	13
1. Dehydroepiandrosterone	13
2. Androst-5-ene-3 β , 17 α -diol	13
4. 16 α -Hydroxydehydroepiandrosterone	13
5. 16 β -Hydroxydehydroepiandrosterone	14
6. 16, 18-Dihydroxydehydroepiandrosterone	14
7. 16-Ketoandrostenediol	14
8. Androstetriol	14
9. Androst-5-ene-3 β , 16 β , 17 α -triol	14
VII. Δ^4 -C ₁₉ Steroids	14
1. Δ^4 -Androstenedione	14
2. Testosterone	15
VIII. Androstane Steroids	15
1. Dihydrotestosterone	15
2. 5 α -Androstan-17-one-3 α , 18-diol	15
IX. C ₁₈ Steroids	15
1. Estrone	15
2. 16 α -Hydroxyestrone	15
3. 16 β -Hydroxyestrone	15
4. 15 α -Hydroxyestrone	16
5. 2-Methoxyestrone	16
6. Estradiol-17 β	16
7. 16-Ketoestradiol	16
8. 11-Dehydroestradiol-17 α	16
9. Estriol	16
10. 16-Epiestriol	17
11. 17-Epiestriol	17
12. Estetrol	17

E. Quantitation of Steroids in Human Amniotic Fluid	18
I. C ₃₀ , C ₂₉ , and C ₂₈ Steroids	18
II. C ₂₇ Steroids	18
1. Cholesterol	18
a) Normal Pregnancies	18
b) Complicated Pregnancies	18
2. Other C ₂₇ Steroids	19
III. Δ^5 -C ₂₁ Steroids	19
1. Pregnenolone	19
2. 16 α -Hydroxypregnenolone	20
3. 17 α -Hydroxypregnenolone	20
a) Normal Pregnancies	20
b) Complicated Pregnancies	20
4. Other Δ^5 -C ₂₁ Steroids	20
IV. Δ^4 -C ₂₁ Steroids	21
1. Progesterone	21
a) Normal Pregnancies	21
b) Complicated Pregnancies	23
2. 16 α -Hydroxyprogesterone	25
3. 17 α -Hydroxyprogesterone	25
4. Cortisol	28
a) Normal Pregnancies	28
b) Complicated Pregnancies	34
5. 6 β -Hydroxycortisol and 6 β , 20 β -Dihydroxycortisol	38
6. Cortisone	40
7. 6 β , 20 β -Dihydroxycortisone	41
8. Other Δ^4 -C ₂₁ Steroids	41
V. Pregnane Steroids	42
1. Pregnanelone	42
2. Pregnanediol	43
a) Normal Pregnancies	43
b) Complicated Pregnancies	44
3. Pregnanetriol	44
a) Normal Pregnancies	44
b) Complicated Pregnancies	45
4. Other Pregnane Steroids	46
VI. 17-Hydroxycorticosteroids	47
a) Normal Pregnancies	47
b) Complicated Pregnancies	47
VII. 11-Hydroxycorticosteroids	47
VIII. Δ^5 -C ₁₉ Steroids	49
1. Dehydroepiandrosterone	49
a) Normal Pregnancies	49
b) Complicated Pregnancies	50
2. Androst-5-ene-3 β , 17 α -diol and Androst-5-ene-3 β , 17 β -diol	50

3. 16 α -Hydroxydehydroepiandrosterone	51
a) Normal Pregnancies	51
b) Complicated Pregnancies	52
4. 16-Ketoandrostenediol	52
a) Normal Pregnancies	52
b) Complicated Pregnancies	52
5. 16, 18-Dihydroxydehydroepiandrosterone	52
6. Androstetriol	52
a) Normal Pregnancies	52
b) Complicated Pregnancies	53
IX. Δ^4 -C ₁₉ Steroids	53
1. Androstenedione	53
2. Testosterone	54
a) Normal Pregnancies	54
b) Complicated Pregnancies	58
X. Androstane Steroids	58
1. Dihydrotestosterone	58
XI. 17-Ketosteroids	58
a) Normal Pregnancies	58
b) Complicated Pregnancies	59
XII. C ₁₈ Steroids	60
1. Estrone	60
a) Normal Pregnancies	60
b) Complicated Pregnancies	60
2. Estradiol-17 β	61
a) Normal Pregnancies	61
b) Complicated Pregnancies	63
3. Estriol	63
a) Normal Pregnancies	63
b) Complicated Pregnancies	68
4. Estetrol	71
a) Normal Pregnancies	71
b) Complicated Pregnancies	71
F. Steroid Conjugates in Human Amniotic Fluid	72
I. C ₃₀ , C ₂₉ , und C ₂₈ Steroids	72
II. C ₂₇ Steroids	72
III. Δ^5 -C ₂₁ Steroids	72
IV. Δ^4 -C ₂₁ Steroids	73
V. 17-Hydroxycorticosteroids	73
VI. Pregnane Steroids	74
VII. Δ^5 -C ₁₉ Steroids	74
VIII. Δ^4 -C ₁₉ Steroids	75
IX. 17-Ketosteroids	75
X. Estrogens	76

G. Steroid Profiles in Human Amniotic Fluid and Distribution of Steroids in Several Compartments.	79
H. Transfer and Metabolism of Steroids in Human Amniotic Membranes.	91
I. Fate of Steroids Injected into the Amniotic Cavity	96
J. Binding of Steroids in Human Amniotic Fluid	99
K. Proteohormones in Human Amniotic Fluid	102
I. Luteinizing Hormone (LH)	102
II. Follicle-Stimulating Hormone (FSH)	103
III. Human Chorionic Gonadotropin (HCG)	104
IV. Human Placental Lactogen (HPL)	107
V. Prolactin (Prl)	111
VI. Adrenocorticotrophic Hormone (ACTH)	116
VII. Human Growth Hormone (HGH)	117
VIII. Somatomedin and Somatomedin C	119
IX. Thyroid-Stimulating Hormone (TSH)	119
X. Thyroid Hormones	120
1. Thyroxine (T_4)	120
2. 3,3',5-Triiodothyronine (T_3)	122
3. Reverse 3,3',5'-Triiodothyronine (rT_3)	123
4. 3,3'-Diiodothyronine (T_2)	125
5. 3',5'-Diiodothyronine and 3,5-Diiodothyronine	125
6. 3'-Monoiodothyronine ($3'-T_1$)	126
XI. Parathyroid Hormone (PTH)	126
XII. Oxytocin	126
XIII. Glucagon	127
XIV. Insulin	128
XV. Hypothalamic-Releasing Hormones	131
1. Thyrotropin-Releasing Hormone (TRH)	131
2. Luteinizing Hormone-Releasing Hormone (LH-RH)	131
XVI. Neurophysin	131
XVII. β -Endorphin and "Humoral Endorphin"	132
XVIII. β -Melanocyte-Stimulating Hormone (β -MSH)	132
XIX. Conclusions	133
Acknowledgments	134
References	135
Subject Index	153