

A Simple Method for the Estimation of Gestational Age

(A Preliminary Report)*

Müyesser Tunçer, M.D.**

It is useful for the neonatologist to estimate the gestational age of the newborn since the type of the initial care which should be provided depends very much on this knowledge. In addition to this, research related to this period requires accurate determination of gestational age.

Many scoring systems of gestational age have appeared in the literature during the last decade.¹⁻⁵ But the application of these methods is rather difficult, even impossible, in the case of the seriously ill infant.

We have been seeking a simpler method which can be applied to a sick baby and which can also be used by an inexperienced person.

It was felt that a new scoring system with fewer variables might be more helpful for determining the gestational age. For this purpose we developed a new system which has 8 criteria, including the appearance of the face. It is a simple method and it correlates well with the last menstrual period of the mother.

Materials and Methods

Thirty babies, admitted to the intensive care nursery of Hacettepe Children's Hospital whose mothers' last menstrual period was known, were scored by Dubowitz' (except the neurologically depressed infants) and by our method simultaneously within 24 hours of birth. Results of both scoring systems and the date of the last menstrual period were recorded. Cases with doubtful menstrual period were not included in the study. Evaluation of all the newborns was carried out by the same person (M.T.)

* From Hacettepe University, Faculty of Medicine, Department of Pediatrics, Section of Neonatology.

** Professor of Pediatrics.

TABLE I
EXTERNAL CRITERIA OF SIMPLE METHOD FOR ESTIMATION OF GESTATIONAL AGE

Score	1	9	12	16	22
Skin texture	Thin, gelatinous red, may have some edema of hands and feet	Smooth, slight thickening, no obvious edema, may have some pitting over tibia	Smooth and medium thickening	Smooth and thick skin	Thick and superficial cracking, parchment-like skin, may be peeling of hands and feet, may have diminished subcutaneous fat tissue
Ear-form and firmness	Pinna flat and shapeless, little or no incurving of edge, soft pinna, easily folded	Incurving of part of edge of pinna, pinna soft and easily folded.	Partial incurving of whole of upper pinna, cartilage to edge of pinna	Firm and well defined incurving of pinna	
Breast size and nipple formation	No breast tissue palpable, nipple barely visible, no areola	Breast tissue diameter < 0.5 cm. nipple well defined, areola smooth and flat, diameter < 0.75 cm.	Breast tissue both sides one or both 0.5-1.0 cm. areola stippled, edge not raised, diameter < 0.75 cm.	Breast tissue both sides > 1 cm. areola stippled, edge raised, diameter > 0.75 cm.	
Plantar creases	No creases	faint red marks over anterior half of sole	Definite red marks over anterior 1/2, indentations over anterior 1/3	Indentations over anterior 1/2	Deep indentations over more than anterior 1/2
Face appearance	Very immature appearance with fairly prominent eyes	Eyes closed most of the time, premature baby face appearance	Eyes open more often, appearance of face more mature than previous stage	Well-shaped face, alert when not sleeping	Very alert looking, eyes open most of the time, may have some wrinkles on the forehead

The findings were scored as shown in Table I, consisting of five external criteria, and Table II, consisting of three neurological criteria. The gestational age was calculated according to the formula given below.

$$180 + A + B = \text{Gestational age in days}$$

A = Score obtained in Table I

B = Score obtained in Table II

Gestational age in weeks is also given in Table II.

TABLE II
NEUROLOGICAL CRITERIA OF SIMPLE METHOD FOR ESTIMATION
OF GESTATIONAL AGE

Days Weeks		SCORE	0	2	4	6	8
189	27	POSTURE	Well Infant				
196	28						
203	29		Depressed Infant				
210	30						
217	31						
224	32	HEAD LAG	Well Infant				
231	33						
239	34		Depressed Infant				
245	35						
252	36						
259	37	SCARF SIGN	Well Infant				
266	38						
273	39		Depressed Infant				
280	40						
287	41						
294	42						
301	43						

Findings and Comments

Gestational ages of 30 cases calculated from the last menstrual period by Dubowitz' and the above presented method are given in Table III. Although no differences in gestational ages between these three methods

were observed, there seem to be four advantages of the method presented above: 1) It can be used with minimal handling of the infant, 2) it can be applied to the depressed and very small premature quite easily, and 3) it correlates well with the last menstrual period of the mother, 4) a new external criterion, appearance of face, is especially useful for scoring infants with fetal malnutrition (Table III cases 4, 14).

TABLE III

GESTATIONAL AGES OF THE 30 CASES DETERMINED BY DUBOWITZ AND TUNÇER SCORING SYSTEMS AND CALCULATED FROM THE LAST MENSTRUAL PERIOD

Case No.	D	T	L.M.P.	Other Findings
1	37	36	36	
2	37	36.5	36.5	
3	39	38	38	
4	37.5	40	41	Fetal malnutrition
5	—	30	29	Depressive baby
6	35	35	35	
7	31.5	33	32	
8	32	32	32	
9	35.5	35.5	35.5	
10	35.5	35	36	
11	—	41.5	41	Dismaturation, depressive baby
12	39	38	38.5	
13	40	40	41.5	
14	38	40	40	Fetal malnutrition
15	33	33	32.5	
16	—	31	31	Depressive baby
17	—	33	33.5	Depressive baby
18	—	34	33	Depressive baby
19	33	33	33	
20	—	36.5	36	Depressive baby
21	32	33.5	33.5	
22	37.5	37	36.5	
23	38.5	39	39	
24	34	34.5	34	
25	38	38	37.5	
26	35	35	34	
27	33	32	31	
28	29	28	27	
29	31	31	30	
30	34	34	33.5	

between D with LMP, $p > 0.05$

between T with LPM $p > 0.05$

between D with T, $p > 0.05$

D : Dubowitz scoring system T : Tunçer scoring system LMP : Last menstrual period

Since the system has few and clear-cut variables, it can easily be applied by different members of the unit despite of varying degrees of experience.

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