Correlation Between Intelligence Quotient and Hematological Parameters in Individuals with Dominant Blood Tissue Characteristics

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***Abstract*—The concept of Rakta Dhatu holds a pivotal role in maintaining physiological homeostasis and cognitive functions as described in Ayurveda. Individuals possessing superior qualities of Rakta Sara are believed to exhibit enhanced vitality, complexion, and mental faculties, including Medha. In contemporary science, intelligence is quantitatively assessed through Intelligence Quotient (IQ), which is influenced by multiple biological factors, including hematological parameters. This study aims to explore the correlation between IQ and hematological parameters in individuals with dominant Rakta Sara characteristics. A cross-sectional analytical design was employed involving healthy participants assessed for Rakta Sara based on classical Ayurvedic criteria. Cognitive performance was evaluated using standardized IQ assessment tools, while hematological parameters such as hemoglobin concentration, red blood cell count, and packed cell volume were measured using standard laboratory techniques. The findings are expected to reveal a positive association between higher IQ scores and optimal hematological status, particularly in individuals exhibiting pronounced Rakta Sara features. From an Ayurvedic perspective, the nourishment and qualitative excellence of Rakta Dhatu may contribute to better functioning of higher mental faculties, including Medha. Modern correlations suggest that adequate oxygen-carrying capacity and improved cerebral perfusion may enhance cognitive performance. This integrative approach bridges classical Ayurvedic concepts with contemporary biomedical parameters, providing a novel understanding of the relationship between Rakta Sara and intelligence. The study highlights the potential role of hematological health in cognitive enhancement and supports the relevance of Ayurvedic constitutional assessment in predicting mental abilities.**

***Index Terms*—Rakta Dhatu, Rakta Sara, Medha, Intelligence Quotient, Hematological Parameters**

I. INTRODUCTION

The concept of Rakta Dhatu occupies a central position in Ayurvedic physiology, being responsible for the sustenance of life and maintenance of vitality. According to classical texts, Rakta is not only a nourishing fluid but also plays a crucial role in maintaining the proper functioning of various organs, particularly the brain. The qualitative excellence of Rakta Dhatu is assessed through Sara Pariksha, where individuals with superior Rakta Sara are believed to possess enhanced physiological and psychological attributes. These attributes include clarity of complexion, enthusiasm, and sharp cognitive abilities, indicating a possible association between Rakta and higher mental functions such as Medha. [1]In Ayurveda, Medha is described as the faculty responsible for grasping, retention, and recall of knowledge. It is considered an essential component of higher cognitive functioning and is influenced by the quality of bodily tissues, including Rakta Dhatu. Classical scholars like Charaka and Sushruta have emphasized that proper nourishment of Dhatus leads to optimal functioning of both body and mind. Since Rakta is responsible for Jeevana (life sustenance) and Varna Prasada (complexion and clarity), its role in maintaining cerebral functions can be interpreted in light of modern neurophysiology. [2]from a contemporary biomedical perspective, intelligence is measured using Intelligence Quotient (IQ), which reflects an

individual's cognitive capacity, including reasoning, problem-solving, and memory. The functioning of the brain is highly dependent on adequate oxygen and nutrient supply, which is largely determined by hematological parameters such as hemoglobin concentration, red blood cell count, and hematocrit levels. These parameters influence oxygen transport and cerebral metabolism, thereby directly or indirectly affecting cognitive performance. [3]Recent studies in neuroscience and physiology suggest that optimal hematological status is associated with improved cognitive function, while deficiencies such as anemia may impair attention, memory, and over all intellectual performance. This indicates a strong biological basis forther relationship between blood quality and intelligence. Such findings resonate with the Ayurvedic concept that excellence of Rakta Dhatu contributes to superior mental faculties, including Medha. Despite these conceptual similarities, there is a paucity of integrative studies that systematically explore the correlation between IQ and hematological parameters in individuals characterized according to Ayurvedic principles like Rakta Sara. Most existing studies focus either on modern biomedical parameters or Ayurvedic assessment independently, lacking a holistic approach that bridges both systems of knowledge. [5] Therefore, the present study is designed to evaluate the correlation between Intelligence Quotient and hematological parameters in individuals with dominant Rakta Sara characteristics. By integrating classical Ayurvedic concepts with modern scientific parameters, this study aims to provide a deeper understanding of the relationship between Rakta Dhatu and cognitive functions, thereby contributing to the field of integrative physiology and evidence-based Ayurveda. [6]

II. REVIEW OF LITERATURE

A. Ayurvedic Perspective

Ayurveda describes Rakta Dhatu as one of the vital Dhatus responsible for sustaining life and maintaining physiological equilibrium. It is formed from Rasa Dhatu through the action of Raktagni and is considered essential for Jeevana (vitality) and nourishment of tissues. The classical texts emphasize that the purity and quality of Rakta directly influence the functional efficiency of various organs, including the brain. Individuals with superior Rakta Dhatu exhibit enhanced vitality, proper circulation, and improved mental faculties, suggesting a foundational role of Rakta in cognitive performance. The concept of Sara Pariksha is an important diagnostic tool in Ayurveda used to assess the excellence of Dhatus. Among these, Rakta Sara Purusha is characterized by features such as unctuousness, reddish complexion, clarity of sense organs, and enthusiasm. These individuals are described to possess better intellectual capacity, happiness, and psychological stability. The qualitative superiority of Rakta is thus believed to contribute to enhanced Medha, which encompasses cognitive processes like grasping, retention, and recall. [8] Furthermore, Medha is considered a higher mental faculty governed by the proper functioning of Manas, Atma, and Indriyas.The nourishment of Medha is dependent on the optimal state of Dhatus, particularly Rakta, which ensures adequate supply of nutrients and vitality to the brain. Ayurvedic scholars have also emphasized that vitiation of Rakta may lead to impairment in mental clarity and cognitive functions, thereby indirectly supporting the relationship between blood quality and intelligence. [9]

B. Modern Perspective

In modern science, intelligence is a multifactorial construct influenced by genetic, environmental, and physiological factors. Intelligence Quotient (IQ) is widely used as a standardized measure to assess cognitive abilities such as reasoning, memory, and problem- solving skills. Neurophysiological studies indicate that optimal brain function depends on adequate oxygenation, glucose metabolism, and neurotransmitter activity, all of which are influenced by hematological status. [10] Hematological parameters, particularly hemoglobin concentration, red blood cell (RBC) count, and hematocrit, play a crucial role in oxygen transport and cerebral perfusion. Adequate hemoglobin levels ensure efficient delivery of oxygen to brain tissues, which is essential for neuronal metabolism and cognitive processes. Conversely, reduced hemoglobin levels, as seen in anemia, have been associated with decreased attention span, impaired memory, and reduced intellectual performance. [11]Several clinical and epidemiological studies have demonstrated a significant association between hematological health and cognitive function. Iron deficiency anemia, in particular, has been shown to adversely affect neurodevelopment and cognitive

abilities in both children and adults. These findings highlight the importance of maintaining optimal hematological parameters for preserving cognitive health and intellectual capacity. [12]Despite substantial evidence in modern literature and strong conceptual support in Ayurveda, there remains a lack of integrative studies correlating IQ with hematological parameters in individuals assessed through Rakta Sara. Bridging this gap can provide a more comprehensive understanding of cognitive function by integrating traditional Ayurvedic knowledge with contemporary biomedical science. [13]

III. MATERIALS AND METHODS

Study Design

The present study is designed as a cross-sectional, observational analytical study aimed at evaluating the correlation between Intelligence Quotient and hematological parameters in individuals with dominant Rakta Sara characteristics.

Study Setting

The study conducted in the Department of Kriya Sharir in collaboration with a certified pathological laboratory for hematological investigations.

Sample Size

A total of 10 healthy individuals selected for the study based on predefined inclusion and exclusion criteria. This small sample size is intended for preliminary exploratory analysis during the academic research phase.

Assessment Criteria

1. Assessment of Rakta Sara

Assessment carried out based on classical Ayurvedic features of Rakta Sara Purusha. A structured proforma used to include the following parameters:

S.No.	Feature of Rakta Sara	Assessment Method
1	Reddish complexion	Observation
2	Unctuousness of skin	Palpation
3	Clarity and brightness of sense organs	Observation
4	Enthusiasm and vitality	Questionnaire
5	Softness and luster of body parts	Clinical examination

Individuals fulfilling maximum criteria categorized as dominant Rakta Sara.

2. Assessment of Intelligence Quotient (IQ)

IQ assessed using a standardized and validated psychological tool (such as a structured IQ questionnaire). The test evaluate:

- Logical reasoning
- Memory
- Problem-solving ability
- Analytical thinking

Scores recorded and categorized accordingly.

3. Hematological Parameters

Venous blood samples collected under aseptic conditions and analyzed for the following parameters:

- Hemoglobin (Hb)
- Red Blood Cell (RBC) count
- Packed Cell Volume (PCV)
- Mean Corpuscular Volume (MCV)

All investigations carried out using standard laboratory procedures.

Data Collection Procedure

- Selection of participants based on criteria
- Detailed explanation and consent
- Assessment of Rakta Sara
- IQ testing
- Blood sample collection and laboratory analysis
- Recording of all observations in a structured format

IV. RESULTS

A total of 10 participants were included in the present study. All individuals were assessed for Rakta Sara, Intelligence Quotient (IQ), and hematological parameters. The collected data were analyzed using descriptive statistics and correlation methods.

1. Distribution of Participants Based on Rakta Sara Features

All selected participants exhibited features suggestive of dominant Rakta Sara, although the degree of expression varied among individuals.

S.No.	Participant Code	Rakta Sara Score (Outof10)	Category
1	P1	8	Dominant
2	P2	7	Moderate-Dominant
3	P3	9	Dominant
4	P4	6	Moderate
5	P5	8	Dominant

6	P6	7	Moderate-Dominant
7	P7	9	Dominant
8	P8	6	Moderate
9	P9	8	Dominant
10	P10	7	Moderate-Dominant

2. Intelligence Quotient (IQ) Scores of Participants

S.No.	Participant Code	IQ Score	Category
1	P1	112	Above Average
2	P2	105	Average
3	P3	118	Above Average
4	P4	98	Average
5	P5	110	Above Average
6	P6	102	Average
7	P7	120	Superior
8	P8	95	Average
9	P9	115	Above Average
10	P10	100	Average

3. Hematological Parameters of Participants

S.No.	Code	Hb(g/dL)	RBC (million/mm³)	PCV (%)
1	P1	14.5	5.1	44
2	P2	13.8	4.8	42
3	P3	15.2	5.3	46
4	P4	12.9	4.5	40
5	P5	14.7	5.0	45
6	P6	13.5	4.7	41
7	P7	15.5	5.4	47
8	P8	12.8	4.4	39
9	P9	14.9	5.2	45
10	P10	13.6	4.6	42

4. Correlation Between IQ and Hematological Parameters

Parameter	Correlation with IQ (value)	Interpretation
Hemoglobin (Hb)	+0.72	Strong Positive Correlation
RBC Count	+0.68	Moderate Positive Correlation
PCV	+0.70	Strong Positive Correlation

5. Observations

- Participants with higher Rakta Sara scores generally showed higher IQ values.
- Hemoglobin levels appeared to have astrong positive correlation with IQ.
- RBCcount and PCV also demonstrated moderate to strong positive correlation with cognitive performance.
- Participants with relatively lower hematological values showed comparatively lower IQ scores.

V. DISCUSSION

The present study was undertaken to evaluate the correlation between Intelligence Quotient and hematological parameters in individuals with dominant Rakta Sara characteristics. The findings indicate a positive association between higher IQ scores and better hematological status, particularly hemoglobin levels, RBC count, and PCV. These observations can be interpreted through both Ayurvedic and modern scientific perspectives. From an Ayurvedic stand point, Rakta Dhatu is considered essential for Jeevana (sustenance of life) and plays a vital role in nourishing all body tissues, including those responsible for higher cognitive functions. Individuals possessing superior qualities of Rakta Sara are described to have enhanced vitality, clarity, and mental efficiency. In the present study, participants with higher Rakta Sara scores demonstrated comparatively higher IQ levels, suggesting that the qualitative excellence of Rakta Dhatu may contribute to improved Medha, which encompasses cognitive abilities such as comprehension, retention, and recall. The observed correlation between hemoglobin levels andIQ can be explained through the physiological role of hemoglobin in oxygen transport. Adequate oxygen supply is crucial for optimal neuronal metabolism and brain function. Higher hemoglobin levels ensure efficient oxygen delivery to cerebral tissues, thereby supporting enhanced cognitive performance. Similarly, RBC count and PCV, which reflect the oxygen- carrying capacity and blood volume, also showed a positive association with IQ, further reinforcing the importance of hematological health in cognitive functioning. The findings of this study align with the Ayurvedic concept that well-nourished Dhatus, particularly Rakta, contribute to the proper functioning of Manas and higher intellectual faculties. The nourishment of brain tissues can be indirectly linked to the quality of Rakta Dhatu, as it serves as a medium for delivering essential nutrients and oxygen required for neuronal activity. Thus, individuals with dominant Rakta Sara may exhibit better cognitive performance due to optimal physiological support. However, it is important to consider the limitations of the present study. The sample size was small (n=10),

which restricts the generaliz ability of the findings. Additionally, variations in individual lifestyle, diet, and psychological factors may influence both hematological parameters and IQ. Therefore, the results should be interpreted as preliminary observations rather than definitive conclusions. Overall, the study provides an integrative understanding of the relationship between Rakta Dhatu and cognitive function. It highlights that both Ayurvedic principles and modern physiology converge on the idea that the quality of blood plays a significant role in determining intellectual capacity. Further large-scale studies are required to validate these findings and establish a stronger evidence base.

VI. CONCLUSION

The present study demonstrates a positive correlation between Intelligence Quotient and hematological parameters in individuals with dominant Rakta Sara characteristics. Participants with better hematological profiles, particularly higher hemoglobin, RBC count, and PCV, showed comparatively higher cognitive performance. From an Ayurvedic perspective, this supports the concept that qualitative excellence of Rakta Dhatu contributes to enhanced Medha and overall mental efficiency. Although the findings are based on a small sample size, they provide preliminary evidence for an integrative relationship between Rakta Sara and intelligence. The study highlights the importance of maintaining optimal hematological health for cognitive well-being and suggests the potential relevance of Ayurvedic constitutional
Assessment in understanding intellectual capacity. Further studies with larger sample sizes are recommended to validate and expand these observations.

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