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Palpitation, perspicacity, and prognosis

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Abstract
Our efforts in this article are to approximate the measures of systolic and diastolic pressure based on only single feature – heart beats-an invincible sign of existence. Though there can be many features attached to the figures indicating the two types of pressure but following 'normality rules' self defense system, within normal limits, always generate corrective measures that, in most cases, compensate the losses occurred. May be medications or any other system followed in the right direction, the system tends to normality.

1. Introduction
It is popularly known that sphygmomanometer and some known electronic gadgets (aneroid) to measure systolic, diastolic, and counting heart beats per minute are known since decades. It has remained a debatable issue that between the above mentioned two gadgets which one is more reliable and consistent. In comparison to sphygmomanometer, without any ambiguity, aneroid is easy to handle and free from technicalities of operations. This has evolved a situation that seasoned physicians tend to keep both and verify the readings of both but we think and it is commonly accepted to prioritize the first one.

Before we proceed to write about our work, it is really essential that we try to define and discuss some important terms frequently used in our article.

1.1 Some Important Terms-Meaning in General
1.1.1 Blood Pressure
The dominant factors that any doctor will first investigate for any subject who is subjected to any type of cardiac problem or has developed any related complaints.

a. Systolic and Diastolic Pressure: It is the pressure which is equivalent to height of mercury column at which flow of blood, at the time of maximum contraction, is temporarily blocked. It is measured in terms of mmHg. The systolic blood pressure is the pressure that the heart muscles exert within the arteries. It is produced primarily by contraction of the heart muscle. The numeric figure which shows its equivalent measurement record on the mercury column is called systolic value. In this article we have symbolize it by x1 In the same way after contraction process heart muscles releases to come to its normal size, allowing impure blood flow in its chamber. The pressure, record just at that point of time is called diastolic pressure. In this paper we have symbolized it by x2.

b. Beats per Minute: The number of times the process of contraction and relaxation of heart muscles is executed in one minute is called beats per minute. It is an integer value generally desirable to be in the range 60 to 90. When the operating system demands for more oxygenated blood the number of beats increases and this is reflected by faster and deeper inhalation. It has been a claim that gymnasts have lower beat rate than the average rate.

c. Pulse Pressure: This measure indicates the positive difference between the systolic pressure (= x1) and diastolic pressure (= x2) on a complete effort of measuring blood pressures in a given trial.

The following quote, at this point of time skips out of the subject area but we found it very useful and important so we couldn't restrict.

In a relatively modern approach we have a focused definition; the body regulates *blood p* pressure through proteins that cause veins and arteries to expand or contract.

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- Kyle Dickman, Outside Online, "A Rattle with Death in Yosemite," 20 June 2018. The amount of pure oxygen required for harmonized functioning of the body cannot be curtailed down or it will render some improper performances. On receiving some emergency information heart muscles will start functioning at a faster rate and with more number of times in some cases too. But this over exertions has an upper limit too. Irregular functioning over a period of time, in most of the cases will paralyze the system from proper functioning.

1.1.2 Associated Factors

On having some glimpses about the major functioning components of the heart we attempt to show some of the major factors which are claimed to be liable causing different hindrances in its activities. These, one or some or all at a time are considered responsible. Some of them are

1. **Aging Factor:** Causing thickness and stiffness in arteries- - Arterial Sclerosis
2. **Elevated level of blood Cholesterol:** There are two types of blood cholesterols; known as high density lipoprotein (HDL) cholesterol and low density lipoprotein (LDL) cholesterol. 2 Cholesterol is a natural substance made by the body. Most of the cholesterol in our bloodstream (75%) is produced by the liver and the remaining 25% comes from the foods we eat. It is known that elevated blood cholesterol levels are not good for health, but the right levels of cholesterol actually play a vital role in maintaining cell membranes and synthesizing hormones. The Centers for Disease Control reports that one-third of adults have high cholesterol levels. Low-density lipoprotein (LDL) cholesterol, often referred to as "bad" cholesterol, is the type that tends to deposit on the walls of the arteries. White blood cells combine with the LDL cholesterol, forming artery-narrowing plaque, which restricts blood flow. The optimal and desired level of LDL cholesterol for most people is 100 mg/dL or lower. If you have heart disease, you may need to strive for LDL levels of 70 mg/dL or lower. Not all cholesterol are bad. High-density lipoprotein (HDL) cholesterol is considered "good" cholesterol because it actually works to keep the LDL, or "bad" cholesterol from building up in your arteries. The higher the HDL the better is the amount of good cholesterol. HDL levels of 60 mg/dL and higher can help reduce your risk for heart disease. Conversely, HDL levels of 40 mg/dL and lower are considered a high risk factor for developing heart disease.
3. **Triglycerides:** Triglycerides are a type of fat found in the blood. Normal levels of triglycerides are 150 mg/dL and lower. Levels higher than that can raise your risk for heart disease and metabolic syndrome, which also is a risk factor for heart disease, diabetes, and stroke.

1.2 Source of Inspiration

What has inspired us the most to shape the words takes us to aeon where the medical services were equally important but with a few under developed devices and even poor medications. It is known that physicians were accustomed to extracts from herbal plants and powders prepared from dried leaves and roots of one or more plantsas per the intuitive and pragmatic sense. Referring to the past in the related area ii was a common practice which had been observed throughout. It is known to followers of Indian heritage in medicinal system that the system is referred as 'Ayurvedic tradition' and its practioners are, till date, called 'Vaidya'. As the name suggests, it is one of the Holy Scripture which is intended and

devoted to bestow longevity (to its followers). In most of the cases practioners of this clan knew the features of many plants, herbs, and climbers and their usefulness to combat against diseases. They had, as a strong version in this system, developed the art of converting highly purified metals to ashes in powder form which preserved all he characteristics of the corresponding metal in active form. It was used in acute and chronic cases.

This article is an inspirational one infused from the diagnostic style of fixing the disease from the function of pulse and its rhythm. Their style of pinpointing the disease were classified according to three performance of three major veins, known as 'Vat', 'Pitta' and ' Cough', which help enjoin them for invincible prognosis. This parallels to three features 'Tone, volume, and Pressure' dedicated to allopathic traditions.

Though allegedly reported independent and partially correlated in functioning these three salient features are, to some extent, enable to primary judgement. With this claim we develop our statistical proceedings.

2 Line of Work

2.1 History. Data Collection: In order to work on the pre-planned objective, we thought that only real life situations shall be more helpful only if we could procure primary data. We visited different physicians and contacted in-charge doctors of cardiology department. Latest records, only for academic work, were sufficiently enough to satisfy the necessity required for statistical work. We have had ten sets of record; each one showing information of 10 patients. The parameters of the records were like, height, weight, age, systolic and diastolic measures, and BPM. Beats per Minute.

2.2 Searching for probable correlation: The first question was related to data management. We sorted the data age-wise. Without much loss of generality one would think of inception of such conditions when he/ she is on the late zone of middle age interval. We will, in this article, parameterize, systolic, diastolic blood pressure by x1, x2 and beats per minute by x3. As mentioned earlier for each one of six groups we find the strength of linear relationship which is also known as Karl Pearson's correlation coefficient and it is conventionally denoted as 'r'. It is known that for $-1 \leq r < 0$, it shows non-sympathetic movement of the variables under discussion. $r = 0$, shows no correlation between the variables $0 < r \leq 1$ shows positive or sympathetic correlation.

In the first phase we try to find correlation between the two variables x1, x2 and derive conclusion based on statistics.

In the following table we have a record of 10 observation collected from a reliable source.

[It is a primary data.] Record -1

Table 1: Working on the same line, we have generated a record of correlation coefficient between x1 and x2 for such ten records

Subject Code	X1 = Systolic	X2 = diastolic	X3 = B.P.M	Correl. coeff. r_{12}
101	137	85	90	
102	120	78	88	
103	110	72	95	
104	118	74	75	
105	125	80	68	
106	130	84	78	
107	132	82	81	
108	117	79	85	
109	123	80	78	
110	140	90	76	
				$R_{12} = 0.943701$

Table 2: Subject code R_{12}

subject code	r_{12}
101	0.337912
102	0.685424
103	0.940606
104	0.948876
105	0.886241
106	0.943701
107	0.911545
108	0.883799
109	0.532041
110	0.424833
Mean of r_{12}	Std. Dev. of r_{12}
0.749498	0.236452

Using the records from the table we conclude that excepting the value of r_{12} that one from the first group record of ten subjects, all are above 0.53

Most of them are above 0.88. Only the first one has lowered down the average of all ten which is 0.749498. Standard deviation is about 33% of the mean value.

3.1 We graph the record.
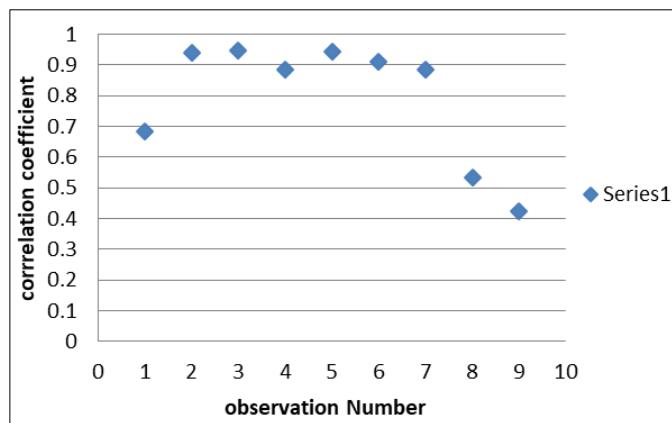
Graph 1: Correlation between x1 and x2

From the graph it is obvious to judge that in most of the cases the correlation coefficient remains 0.85; this clearly helps us conclude tat there is a strong correlation between x1 (Systolic) and x2 (Diastolic) pressures.

4. Conclusion
We had already determined to work in the same area but were initially in dilemma for the target. It is very obvious, as we have derived, that there is a strong correlation between the two variables but in 10 to 15 % of cases the nature gives us hard time. It means distinctly that there are more variables to be studied that hinder our target. We will try to find all such and try to eliminate their impacts from our work. We need patience and perseverance.

5. Vision
The basic flow of nature is to produce a throb and the machinery sets its operation.

The next article that we have already thought of is to set up mathematical relation between heart rate (= x3) with the two variables x1 and x2. If a reasonably feasible relation is found then minimizing some discrepancies we will be able to generalize to some extent. This logic, as we have started, is looks more viable but let the time judge it.

6. Acknowledgement
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