

Stress-related fatal cardiovascular events in the Holy Bible

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Acute emotional stress as response to negative events may trigger cardiovascular events (CVEs), usually in at-risk individuals or individuals with ongoing cardiovascular disease (CVD), via several biological mechanisms including the activation of both the sympathetic nervous system and the hypothalamic–pituitary–adrenal axis, leading to increases in circulating catecholamines, glucocorticoids, and inflammatory cytokines¹. Moreover, stress can increase heart rate and blood pressure via the sympathetic nervous system, all of which can contribute to endothelial dysfunction. Recently, an increased metabolic activity of amygdale (a key neural center involved in the perception of stress) measured on ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography (¹⁸F-FDG-PET/CT), was found to be an independent predictor of CVD via a pathway that involves increased bone marrow activity (an index of leukopoiesis) and arterial inflammation². However, the association between acute emotional stress and fatal CVEs was described in the Bible centuries before. In this

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1. See: T. E. Kraynak, et al., “Neural mechanisms linking emotion with cardiovascular disease”, *Current Cardiology Reports* 20 (2018), p. 128; D. Kotlega et al., “The emotional stress and risk of ischemic stroke”, *Neurologia i Neurochirurgia Polska* 50 (2016), pp. 265-270; W. Jiang, “Emotional triggering of cardiac dysfunction: the present and future”, *Current Cardiology Reports* 17 (2015), p. 91; S. Vale, “Psychosocial stress and cardiovascular diseases”, *Postgraduate Medical Journal* 81 (2005), pp. 429-435; A. Tawakol, et al., “Relation between resting amygdalar activity and cardiovascular events: a longitudinal and cohort study”, *Lancet* 389 (2017), pp. 834-845.

2. See: A. Tawakol, et al., op. cit.; T. Dar, et al., “Psychosocial stress and cardiovascular disease”, *Current Treatment Options in Cardiovascular Medicine* 21 (2019), p. 23.

study we present six fatal, probable cardiovascular, events that happened under acute emotional stress.

The first probable CVE is described in the Old Testament and concerns the death of Nabal³. Nabal was a harsh, wealthy Maonite sheep owner, married to a kind woman named Abigail. Nabal refused David's request to provide food for him and his men, forgetting that David's men had protected Nabal's flocks from marauding bands. Thus, David commanded his troops to attack Nabal's home. When Abigail was informed of David's intentions, she greeted him with generous gifts of food and drink and persuaded him not to become guilty of shedding her husband's blood. Nabal, his family, and servants were saved through her actions, although Nabal was unaware of what his wife had done. On her return home, she found Nabal drunk, so waited until the next morning to tell him of her encounter with David and how near death he had caused them all to come. "*Then in the morning, when Nabal was sober, his wife told him about these events, and his heart failed him and he became like a stone. About ten days later, the Lord struck Nabal and he died*". Nabal suffered an acute myocardial infarction (AMI) and died after ten days because of a second AMI (reinfarction) or other complication (e.g., postinfarction ischemia, arrhythmia), or suffered a severe stroke that ultimately led to his death⁴. The acute emotional stress (anger) triggered by Abigail's actions, the previous night's drunkenness as well as the hard, testy, hostile and aggressive character of Nabal (type A personality), probably contributed to the development of the fatal cardiovascular episode⁵. In my opinion, Nabal was a person with chronic hypertension accompanied by atherosclerosis. Therefore, the acute anger caused a sudden further

3. See: *1 Samuel* 25, 2-38.

4. S. K. Mathew and J. D. Pandian, "Newer insights to the neurological diseases among biblical characters of Old Testament", *Annals of Indian Academy of Neurology* 13 (2010), pp. 164-166.

5. See: M. Friedman, et al., "Plasma catecholamine response of coronary-prone subjects (type A) to a specific challenge", *Metabolism* 24 (1975), pp. 205-210; Y. Chida and A. Steptoe, "The association of anger and hostility with future coronary heart disease: a meta-analytic review of prospective evidence", *Journal of the American College of Cardiology* 53 (2009), pp. 936-946; A. Haukkala, et al., "Hostility, anger control, and anger expression as predictors of cardiovascular disease", *Psychosomatic Medicine* 72 (2010), pp. 556-562.

increase in his blood pressure resulting in the occurrence of a stroke by a cerebral aneurysm rupture or thrombosis.

The second and third probable CVEs are also described in the Old Testament and concern the death of the Jewish elderly priest Eli⁶ and his pregnant daughter in law⁷. These events occurred after the defeat of Israel by the Philistines, when the Holy Ark was captured and Eli's two sons, Hophni and Phinehas, died. A survivor from the tribe of Benjamin ran from the battlefield to inform Eli of the terrible news. When the blind, 98-year-old, Eli heard the bad news, he fell backwards off his chair, broke his neck and died. Meanwhile, when the pregnant wife of Phinehas heard the news, went into labor and died during delivery, but not before she named her son. Although several medical factors may have played a role in Eli's fall, it can not be ruled out a stress-induced stroke or cardiac event as a possible cause of his fall and subsequent death. Cardiovascular events may have included vasovagal syncope, arrhythmia, or myocardial infarction, any of which could decrease blood flow to the brain resulting in a fall. Moreover, it can not be ruled out that the the start of uterine contractions to delivery and the subsequent death of the pregnant wife of Phinehas was due to emotional-stress induced peripartum Takotsubo cardiomyopathy (known also as stress cardiomyopathy or broken heart syndrome)⁸.

The fourth and fifth probable CVEs are described in the New Testament and concern the death of Ananias and his wife Sapphira⁹ who were members of the early Christian congregation of Jerusalem. Following Pentecost of 33 A.D., a common fund was set up for the physical needs of the believers who remained in Jerusalem. It was sustained by contributions comprising the price of fields and houses members of the

6. See: *1 Samuel* 4, 12-18.

7. See: *1 Samuel* 4, 19-22.

8. See: A.R. Lyon, et al., "Current state of knowledge on Takotsubo syndrome: a position statement from the taskforce on Takotsubo syndrome of the Heart Failure Association of the European Society of Cardiology", *European Journal of Heart Failure* 18 (2016), pp. 8-27; R. Citro, et al., "Subsequent safe pregnancy with cesarean delivery in a patient with a history of peripartum Takotsubo syndrome complicated by cardiogenic shock", *Journal of Cardiovascular Echography* 27 (2017), pp. 114-117.

9. See: *Acts* 5, 1-10.

congregation sold then voluntarily donated¹⁰. Ananias sold a field and, with his wife's full knowledge, presented a part of the proceeds, while giving the impression of turning in the entire sum, no doubt to gain some commendation and esteem within the congregation. Peter pointed out that Ananias was in control of the money and could give or keep it as he saw fit, but had withheld a portion of it. Peter stated that Ananias had lied not to men, but to God. On hearing Peter's words, Ananias fell down and died. Three hours after Ananias' death his wife arrived, unaware of what had happened. Peter asked her the price of the land that she and Ananias had sold, and she stated the same untruthful price that Ananias had given. Peter said to her, "*How could you conspire to test the Spirit of the Lord? Listen! The feet of the men who buried your husband are at the door, and they will carry you out also*". At that moment Sapphira fell down at his feet and died. The sudden deaths of Ananias and Sapphira while the apostle Peter reproached them for their lie, was probably due to sudden cardiac arrest under acute emotional stress (intense sorrow) that they experienced in revealing the truth and control consciousness (shamefulness). It can not be ruled out that the death of both was due to Takotsubo cardiomyopathy, considering that the severe form of this syndrome can cause cardiogenic shock, ventricular arrhythmias and cardiac death¹¹.

The last probable CVE due to acute emotional stress is described in the New Testament and concerns the pray and death of Christ. The psychosomatic state of Christ, praying in the garden of Gethsemane, is described by the Evangelists Luke and Matthew as follows: "*And He withdrew from them about a stone's throw, and He knelt down and began to pray, saying, «Father, if You are willing, remove this cup from Me; yet not My will, but Yours be done». Now an angel from heaven appeared to Him, strengthening Him. And being in agony He was praying very fervently; and*

10. See: Acts 4, 34-37.

11. See: K. Komamura, et al., "Takotsubo cardiomyopathy: pathophysiology, diagnosis and treatment", *World Journal of Cardiology* 6 (2014), pp. 602-609; S. Y-Hassan and P. Tornvall, "Epidemiology, pathogenesis, and management of takotsubo syndrome", *Clinical Autonomic Research* 28 (2018), pp. 53-65; E. E. Mazokopakis, "Takotsubo syndrome in the Holy Bible", *Clinical Autonomic Research* 29 (2019), p. 129.

*His sweat became like drops of blood, falling down upon the ground*¹². “*And He took with Him Peter and the two sons of Zebedee, and began to be grieved and distressed. Then He said to them, «My soul is deeply grieved, to the point of death; remain here and keep watch with Me»*”¹³. The bloody sweating (hematidrosis) of Christ in the garden of Gethsemane was an indication of intense emotional stress¹⁴. Moreover, we can not exclude that in the garden of Gethsemane Christ truly suffered AMI¹⁵. Even after His arrest in the garden of Gethsemane, Christ continued to experience a variety of symptoms of psychosomatic stress during the exhaustive inquiries, the abandonment by His disciples, the humiliation, barbarous torture and whipping, the condemnation of the mob, the bearing of the Cross and His Crucifixion. All of these undoubtedly contributed to the burden on his cardiovascular system and consequently lead to the earliest occurrence of His death on the Cross. Many scholars support the view that the most likely immediate cause of Jesus’ death was myocardial infarction complicated by heart rupture¹⁶.

It is worth noting that the association between emotional stress and cardiovascular health / long life is found, moreover, in the following biblical verses¹⁷:

I. *Wisdom of Sirach* 38, 18-20 (Septuagint): “End your sorrow because sorrow causes death, and sorrow of the heart undermines strength (sorrow undermines the strength of the heart). In the sad circumstances of life, sorrow always comes. The life of the poor is a constant sadness of the heart (the life of the poor depresses the heart). But do not let sorrow capture your heart; drive it away and remember that you too will die (remember the last end)”.

12. *Luke* 22, 41-45.

13. *Matthew* 26, 37-38.

14. E. E. Mazokopakis, *The psychosomatic stress of the God-Man Jesus Christ in the garden of Gethsemane. A religious - theological and medical approach*, Chania 2021. N. Kluger, “Hematidrosis (bloody sweat): a review of the recent literature (1996-2016)”, *Acta Dermatovenerologica Alpina, Pannonica, et Adriatica* 27 (2018), pp. 85-90.

15. M. Bevilacqua, et al., “The causes of Jesus’ death in the light of the Holy Bible and the Turin Shroud”, *Open Journal of Trauma* 1 (2017), pp. 37-46.

16. M. Bevilacqua, et al., op. cit.

17. See: J. Kolitsaras, *The Old Testament according to the Seventy. Text, Interpretation, Brotherhood of Theologians the “Life,” Athens 1970-1973 (in Greek)*; E. E. Mazokopakis, “Sorrow and cardiovascular events”, *Journal of Internal Medicine* 283 (2018), pp. 413-414.

II. *Wisdom of Sirach* 30, 21-24 (Septuagint): “Give not over thy mind to heaviness, and afflict not thyself in thine own counsel. The gladness of the heart is the life of man, and the joyfulness of a man prolongeth his days. Love thine own soul, and comfort thy heart, remove sorrow far from thee: for sorrow hath killed many, and there is no profit therein. Envy and wrath shorten the life, and carefulness bringeth age before the time”.

III. *Proverbs* 25, 20 (Septuagint): “As the moth eats the clothes and the worm eats the wood, so the sorrow of the man damages his heart”.

IV. 2 *Corinthians* 7, 10: “For the sorrow that is according to the will of God produces a repentance without regret, leading to salvation, but the sorrow of the world produces death”.

ΠΕΡΙΛΗΨΗ

Θανατηφόρα καρδιαγγειακά επεισόδια σχετιζόμενα
με τὸ στρες στὴν Ἁγία Γραφή

Πλοιάρχου (ΥΙ) Ἡλία Μαζοκοπάκη
δρ. Ἰατρικῆς, Πανεπιστήμιο Κρήτης
δρ. Θεολογίας, Ε.Κ.Π.Α.

Τὸ ὀξύ συναισθηματικὸ στρες, ὡς ἀπάντηση σὲ δυσάρεστα γεγονότα, μπορεῖ νὰ προκαλέσει καρδιαγγειακὰ συμβάματα, μέσῳ διαφόρων παθοφυσιολογικῶν μηχανισμῶν. Στὴν παρούσα μελέτη παρουσιάζονται καὶ συζητοῦνται ἕξι θανατηφόρα, πιθανῶς καρδιαγγειακά, επεισόδια, σχετιζόμενα μὲ ὀξύ συναισθηματικὸ στρες, ὅπως αὐτὰ περιγράφονται στὴν Ἁγία Γραφή (Παλαιὰ καὶ Καινὴ Διαθήκη).