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VASCULAR HAEMORRHAGE CAUSES, SIGNS, AND TREATMENTS

Dr. Jaweria Shaheen[1], Zainab Malik[2], Lanka GGPK Gajanayake[3], Glory Aigbedion[4], Dr. Faheem ilyas[5], Atta Ur Rehman[6], Tariq Rafique[7], Nosheen Akhtar[8], Dr Gul Naz[9], Almas Faryal Nizam[10]

[1]PhD Biochemistry, Head of Biochemistry Department, Sargodha Institute of Health Sciences Affilicated with GC University, Faisalabad, Pakistan,
Email: shaheen_jawaria@hotmail.com

[2]M.Phil Scholar, Department of Zoology Wildlife and Fisheries, University of Agriculture Faisalabad, Pakistan,
Email: malikzainab658@gmail.com

[3]*Peking University, Beijing, China,
Email: pramodinigajanayake@icloud.com

[4]Lecturer Department of Health and Sports Science Regent College London, United Kingdom,
Email: ogeonyema@gmail.com

[5]MBBS, AIMC, KMU, Email: faheem.rajpoot.94@gmail.com

[6]Public Health Supervisor, Shaheed Zulafiqar Ali Bhutto Medical University, Islamabad, Pakistan,
Email: attaurrehman1987@yahoo.com

[7]Assistant Professor Dadabhoy Institute of Higher Education, Karachi, Pakistan E mail: dr.tariq1106@gmail.com

[8]College of nursing, Niazi medical and dental college Sargodha, Pakistan Email: nosheen.rana1@gmail.com

[9]Senior Registrar, Mayo.hospital Lahore, Email: drgul613@gmail.com

[10]Department of Zoology, Shaheed Benazir Bhutto Women University, Charsadda Road, Peshawar Pakistan, Email: almasfaryal@gmail.com

*Corresponding author

ABSTRACT

The vascular system comprises a network of blood vessels known as arteries, veins, and capillaries. Hemorrhage, which can occur internally and externally, is a term used in medicine to describe the leakage of blood from damaged blood vessels. Hemorrhages sometimes entail severe bleeding that arises quickly. Hemorrhages primarily result from wounds or specific disorders, including blood loss from the vascular system's blood vessels. Reviewing the current literature on the causes, symptoms, and treatments of vascular bleeding is the primary goal of this study. Referencing some criteria and professional opinions that have been demonstrated to reveal the causes, symptoms, and treatment of vascular bleeding, as well as other connected elements, are shown in the results.

The vascular or circulatory system, composed of a network of blood vessels known as arteries, veins, and capillaries, was shown to be involved in any bleeding. Therefore, bleeding at any level of this system that results from a trauma or an illness is related to vascular hemorrhage; these are its causes. The kind, motivation, and degree of the bleeding will typically influence the symptoms and course of treatment for this problem.

Keywords: Extravasation, endothelium, vascular permeability, diathesis, and bleeding disease.

INTRODUCTION:

The venous and artery systems are two of the human body's most vital and remarkable. The veins return the oxygen-rich blood that the latter transport back to the heart and lungs to finish replenishing oxygen in the body. The vascular system comprises a network of blood vessels known as arteries, veins, and capillaries. The capillaries are a network of minuscule blood vessels that connect arterioles (small arteries) and venules (small veins) to transport oxygen-rich blood from the heart to tissues or organs. Veins return blood and waste products to the heart. The capillaries' fragile walls allow for the flow of materials between the blood and tissues (Northup et al., 2021).

According to the National Cancer Institute (NCI) of the National Institutes of Health (NHI) of the United States of America, a hemorrhage is defined in medicine as the leakage of blood from the affected blood vessels, which can occur both internally and externally and is characterized by heavy bleeding in a short amount of time. Specifically, "Hemorrhage is the leakage of blood from the vascular system through an interruption of continuity that occurs at any level of it, i.e. in the heart, arteries, veins, and capillary territory."

From the preceding, it should be evident that all hemorrhages include the specified vascular or circulatory system, as it is also known. Therefore, when discussing vascular hemorrhage, we mean bleeding generally (Hayes et al., 2010).

It may be brought on by trauma or linked to a pathology. They made it clear: A hemorrhage is a disorder distinguished by the extravasation of blood from the vascular bed. The hemostatic system stops this blood loss through precise interactions between the elements of the vascular wall, moving platelets, and plasma proteins. However, bleeding still happens even when hemostasis is expected when the sickness or injury is severe or severe enough to damage arteries or veins (secondary bleeding disorders). Less frequently, the presence of inherited or acquired hemostatic system problems leads to more or less broad hemorrhages (Shakur & Roberts, 2019), either spontaneous or brought on by trauma, whose entity is not always associated with the severity of the injury. (Primary bleeding disorders) stroke (González-Duarte et al., 2008).

Reviewing the current literature on the causes, symptoms, and treatments of vascular bleeding is the primary goal of this study. We will attempt to discuss the most crucial issues that may be found concerning this topic, keeping in mind that its development could reach a length not usual for this type of research. The applied research approach is presented after that to proceed with the results gained afterwards. The criteria and viewpoints of the experts who participated in the poll will be used as support for this section's discussion of vascular hemorrhage and associated topics, including definitions, categorization, causes, symptoms, and treatments. The relevant conclusions from the interpretive examination of the sources studied are then given (Imparato et al., 1983; Martin & Key, 2016).

MATERIALS AND METHODS:

Depending on the sources used, this study may be classified as a bibliographic survey or a descriptive study, depending on the goal. The applied technique is centred on a review of the content and recent academic and scientific sources, using which it can offer information on the causes, symptoms, and treatment of vascular bleeding. In the middle of November, various information sources were researched, primarily using personal and business computers with Internet access and looking into public and private libraries (Mansfield, 1995).

In the middle of November, various information sources were researched, primarily using personal and business computers with Internet access and looking into public and private libraries. In each case, we have made an effort to gather data from books, chapters and volumes of books, electronic books, original articles (papers) in academic and scientific journals, bulletins, news, or summaries of scientific studies, clinical studies on humans or animals, randomized controlled trials, case-control studies, case series, cohort studies, prospective cohort studies, case reports, conference materials or documents, and university, post-graduate, and doctoral theses. It was also considered what could be contributed through audiovisual or direct interlocutory interactions (Visser et al., 2021).

Consultation on many digital platforms, including specialized search engines, yielded the most significant resources and information sources. Websites and archives with institutional status. However, to a lesser extent, data may be gathered through other websites. Of these, the best results were obtained with the consultation carried out in the databases of the Virtual Health Library (VHL), MEDLINE (PubMed), Elsevier (ScienceDirect), SciELO, Dialnet, and Medigraphic portal (Etzkowitz, 1998).

The research was tested using formulations or research equations that we developed. These formulations were created by arranging and conjugating keywords, medical terms, and logical or Boolean operators (Czarnitzki et al., 2011). The majority of the resources and sources linked here can be found using the terms listed below:

1. Vascular hemorrhage plus symptoms plus causes plus remedy 2.
Vascular bleeding 3. Blood loss.

The total results from each attempt were deemed sufficient to accomplish the desired goal. Still, due to the variety of the results, extra refining criteria available in each search platform had to be used. This was done to more accurately choose sources that are relevant to the issue and the goals established and, to the greatest extent, make it easier to distinguish and express the mutually agreed upon concepts. Some filters used were: in the previous ten years for publishing periods;

Spanish and English speaking; full (preferred) access; human medicine and health sciences as the research area; and the categories of bibliographic materials listed above (Wong et al., 2010).

Before wrapping up this section, it's vital to note that separate content, such as editorials or editorial letters, and repeated (duplicate) content results have been eliminated because they were discovered in a prior search. And other sorts of bibliographic resources that lack sufficient evidence are of little scientific value or were written by authors of treatises who lack human or health science credentials or did not base their work on academic or scientific sources (Mehta et al., 2001).

RESULTS:

Hemorrhages are usually the result of an injury or a disease and involve the loss of blood from the vascular system's blood vessels through arterial, venous, capillary, or cardiac extravasation (see Figure 1). The three pathogenetic mechanisms by which hemorrhages happen due to Alexis, diapedesis, and hemostasis disorders are explained by the same authors and are as follows:

1. Bleeding caused by Alexis: of arterial, venous, or cardiac origin, when the rupture is caused by the vascular wall's weakness and inability to withstand the blood pressure, as in cases of arterial hypertension (Laine & Jensen, 2012; Sokolow et al., 1966).

The rupturing of the vascular walls may have the following causes:

a) Traumatic: such as when vascular tissue is cut voluntarily or unintentionally.
b) Traumatic necro: When a blood vessel is present in the pre-existing lesion, as in gastroduodenal ulcers or tuberculous caverns.
c) Corrosion: a process that occurs outside of the bloodstream and compromises surrounding blood vessels.
d) Degenerative: This reduces the wall's resistance and changes the wall's structure.

Local dysplasias lead to vascular disorders.

2. Bleeding caused by diapedesis: caused by a lesion of the endothelial wall or of the basement membrane, which can equally impact venules and metaarterioles; this type of bleeding occurs in the vascular microcirculation, particularly in the blood capillaries (Lasczkowski et al., 2005; Page, 1934).

The endothelial lesion resulting from this will lead to various peritrophic alterations, including endothelial necrosis or detachment and alteration of the basement membrane, which increases vascular permeability and creates a passive pathway for blood components. The most frequent causes of endothelial injury with capillary hemorrhage include hypoxia, chemicals from drugs or the environment, certain inflammations, and vitamin C deficiency (Semerjyan et al., 2018).

3. Bleeding brought on by hemostasis disorders: these conditions, including hemophilia, cause profuse or petechial bleeding and are caused by changes in platelets or coagulation mechanisms (Page & Heuer, 1935).

Vascular bleeding causes

It is crucial to refer to the classification in which they can be significantly separated since the etiology of a vascular hemorrhage differs depending on the kind.

The following categories can categorize bleedings based on their origin, nature, or severity (Nardone et al., 1999).

According to the type of bleeding, it may be:

- Internal, not external; brought about by blood vessel ruptures inside the body that prevents the blood's contents from escaping.
- Outsourced internal: Similar to the previous type, but with the exception that with this one, blood flow occurs through the body's standard orifices (such as the urethra, rectum, mouth, and ears) rather than inside the body.
- External; refers to bleeding from cuts that are still open. Depending on its source (the blood vessel in question), it may be:
- Hair; low pressure and intermittent flow (the most prevalent and not particularly dangerous).
- Venous: Constant flow, low pressure, and dark crimson blood are characteristics.
- Arterial; high pressure and blood flow, with pale crimson blood. (most grave)

For their side, they say that depending on where the bleeding originated, it may be caused by:

- Strokes, particularly those with cerebral origins.
- Epistaxis of the nose
- Melena appears in the stools as dark stools in the lower digestive segment (Nguyen et al., 2009).
- Hematemesis, which causes vomiting if it develops in the upper digestive tract

Anal bleeding that is fresh and has a distal origin is referred to as rectal bleeding.

- The cardiac etiology of hemopericardium
- If it is a joint, hearts
- Bleeding into the peritoneal cavity, if it happens.
- Vaginal origin haematocolpa
- If they develop in the testicular albuginea, hematocele • Bronchopulmonary hemoptysis is expelled by sputum.
- Hematuria: urinating with blood in it

Menorrhagia is the medical term for uterine bleeding that occurs with a period.

- Cutaneous bleeding:

- Petechiae: small, 2 mm-diameter pinpoint hemorrhages (discoidal or annular).
- Purpura: bleeding between petechiae and ecchymoses
- Ecchymosis: a lot of bleeding on the skin • Suffusion: tissueinfiltrating hemorrhage.
- Hematoma is an accumulation of blood in other tissues or subcutaneous cellular tissue (Noguchi et al., 2001).

Considering gravity:

- Mild: When the hemorrhagic loss is 500 cc or less.
- Moderate: Losing 10 to 15% of blood volume while only losing 500–1000 cc of blood without exhibiting any general symptoms.
- Severe: When the leak volume is over 1000 cc, and 15 to 30 percent of blood volume is lost. The patient may suffer from hypovolemic shock in this scenario. Depending on how quickly the leak occurs, the severity of the situation would vary, and if the source were an arterial vein, there would be a fatal outcome.
- Extremely serious: indicates the existence of hypovolemic shock and consists of a blood volume loss of 1500–3000 cc, or 30–60% of blood volume.
- Massive - Fatal: the patient dies when the bleeding surpasses 3000 ccs, and more than 60 to 100% of the blood volume is lost (Fine et al., 1946).

It is interesting to note that, in the same aspect, they have added the categorization of bleeding according to the triggering factor, which can be: Although there are also apparent coincidences with the techniques above of classifying bleeding (Clark et al., 1947),

- Traumatic, direct and indirect trauma are the most common.
- Inflammatory (infections), including syphilis, vasculitis, and pneumonia.
- Toxic chemical agents, including lead, arsenic, and mercury.
- Tumours and other neoplasms invade the vascular wall, causing bleeding that can be fatal.
- Bleeding dystrophy and congenital capillary fragility.
- Linked to immunological conditions • Linked to alterations in blood constituents:
- Congenital or acquired fibrinogen; fibrinolysis
- Hypoproteinemia (liver disease or vitamin K insufficiency)
- Thrombopathies, sudden embolic occlusion, and thrombocytopenia
- Hypersplenism; Idiopathic thrombotic purpura; Thrombotic thrombocytopenic purpura

- drugs
- Aplastic bone marrow.

Except for familial hemorrhagic telangiectasia, vascular bleeding disorders are caused by blood vessel anomalies that typically result in petechiae, purpura, and ecchymoses but infrequently result in severe bleeding. In Ehlers-Danlos syndrome and other uncommon inherited connective

tissue illnesses (such as pseudoxanthoma elastica, osteogenesis imperfecta, and Marfan syndrome), bleeding may be caused by a lack of vascular and perivascular collagen. Scurvy and immunoglobulin A-associated vasculitis, a hypersensitivity vasculitis frequent in children, can have bleeding as a significant symptom (Alexander, 1939).

It's also crucial to note that bleeding inside the skin can also be caused by blood vessels rupturing, which can result in petechiae (small red dots), purpura (blood accumulating in more significant flat areas), or ecchymosis (region with massive bruising) (Page & Heuer, 1935; Strandgaard et al., 1973).

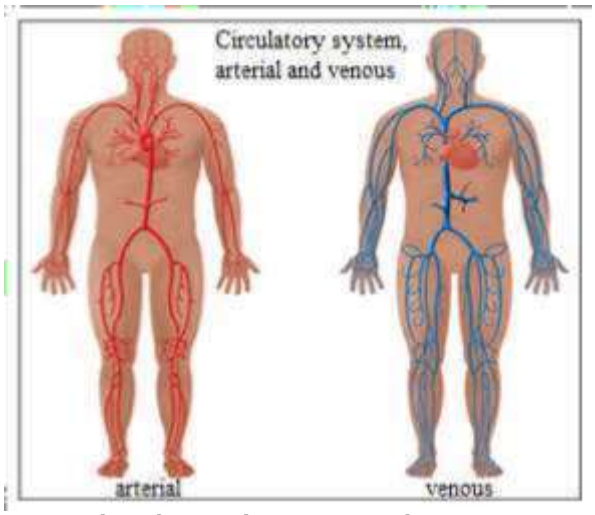

Figure 1: lists the circulatory or vascular systems. Source: Vascular System Overview.

Cancer (leukemia), cirrhosis, colon polyps, stomach problems, hemophilia or poor blood coagulation, aneurysms and other vascular illnesses, trauma, and other possible internal bleeding causes. External bleeding can have various reasons, including bruising, nosebleeds, open fractures, severe trauma, open wounds, and more (Besses et al., 1999).

Vascular bleeding symptoms

Depending on the type of bleeding, other symptoms might be present. While the symptoms of external bleeding may include shock, confusion or loss of mental clarity, cold and clammy skin, vertigo or dizziness after the injury, hypotension, pallor, and tachycardia, among other things, those of internal bleeding can include anxiety, dizziness, dilated pupils, cold and clammy skin, paleness, shortness of breath and accelerated heartbeat (Nardone et al., 1999).

Vascular bleeding therapy

A hospital's assistance with a blood treatment service is typically required in cases of primary bleeding problems. Therefore, it is advised to transfer the patient to the hospital's Emergency Department with blood products if the clinical suspicion persists or laboratory diagnostic tests confirm a symptomatic primary hemorrhagic disease, provided that the initial therapeutic controls have been initiated as though it were an additional bleeding condition (Willemse et al., 2000).

Regarding treating secondary bleeding disorders, particularly those brought on by vascular diseases or other circulatory issues with a bleeding trigger unconnected to the vascular bed itself. Such as aneurysm, arteriosclerosis, blood clots, ASD, coronary and carotid artery disease, Raynaud's syndrome, stroke, varicose veins, and vasculitis; leak even in the presence of an unharmed hemostatic system; The severity of the process will depend on the location and amount of the bleeding in these cases, according to the same treatises (Pellegrino et al., 2020), which state that "actions before a bleed include: assessment of the extent of blood loss, maintenance of proper ventilation and hemodynamic stabilization of the patient, and specific treatment based on the site of the bleed."

The author specifically stated: In external bleeding. Direct pressure on the cut should be applied to stop the blood flow, or you can use a compress or any clean cloth you have on hand. If an object is still buried, it must not be removed from the lesion to prevent pressure from being applied to the main arteries or veins, which could cause further damage to the affected area (Bulger et al., 2014).

Firm pressure should be applied to one of the arterial access points between the wound and the heart if bleeding has not stopped after 15 minutes of direct pressure.

Bleeding internally

The emergency move is maintaining the patient's stretched-out position, tilting his head to one side so he can breathe, lifting it slightly, and placing a pillow beneath it. It is advised to check the airways' permeability and to assess respiration and circulation. To administer them, an intravenous line must be obtained. Depending on the severity of the situation, withdraw fluids or blood while attempting to minimize the prevalence of hypovolemic shock (Kheirabadi, Edens, et al., 2009).

After the vital signs have stabilized, the patient must be transported promptly to the hospital while being kept in an anti-shock position to prevent heat loss from occurring to the sufferer. Depending on the afflicted organ, surgical treatment will be administered as soon as you arrive at the hospital. By ropes, wires, and other thin things that could cut off the tissues or the circulation, the tourniquet is a technique used to stop acute bleeding that the standard system cannot stop by compressing the blood vessels. When compressing, it is customary to place a triangular-folded handkerchief or similar item over the bleeding area that is wide enough (approximately 5 cm) (Ellis-Behnke et al., 2006).

Although it carries hazards, including gangrene or death from autointoxication, the tourniquet is a beneficial technique in cases of traumatic amputation of extremities, prolonged crushing, or failure of standard procedures to manage excessive bleeding. Although sweat can wash away some inks, such instructions must be placed in a readily visible location. It is advised to write down the time and location of the tourniquet on a large piece of paper, which will be attached to the victim's clothing or launched directly on the skin, preferably on the forehead (Lojpur, 2020).

The exact order of concepts was identified for the Navarra College of Nursing's requirements. And they go on to clarify that: Direct compression, gauze on the wound, and intense pressure are required in the event of external bleeding. When the wound has healed, a bandage can be used in place of direct pressure (Kheirabadi, Scherer, et al., 2009).

Bleed, especially if there are numerous open wounds or when the area is large.

If bleeding is present in the extremities, it is best to elevate the injured area above the heart to lower blood pressure at the site of the lesion and, depending on whether the bleeding is in the arms or legs, apply direct pressure to the corresponding artery by pressing the vessel with your fingertips against the bone beneath the street (Malik et al., 2021).

The brachial or humeral artery (found in the arm; pressure must be applied at the level of the flexure or front of the elbow) will be pressed with the palm if the upper limbs are bleeding. If the bleeding is in the lower limbs, the femoral artery, which runs from the thigh to the back of the knee, will be pressed with the heel of the hand in the groin (Wang et al., 2020).

Applying local cold to the skin while covering it with a cloth or piece of gauze is sufficient in the event of internal bleeding if it is capillary because the cold constricts the blood vessels and shrinks the hematoma. If it's venous or arterial, we'll need to keep an eye on whether your abdomen feels sore or stiff, if you feel faint or dizzy, if you feel incredibly pale, if your pulse is weak or undetectable, or if you bruise, vomit blood, or have blood come from your rectum or vagina (Catarino et al., 2019).

There are several sorts and ways to proceed in the event of externalized bleeding:

The only bleeding that should not be stopped is otorrhagia (bleeding in the ear). If the blood is not allowed to drain, it might build up inside the skull and result in catastrophic injury. The injured person must be moved to the side where the bleeding is happening, wrapped in gauze, and taken to the hospital (Saint-Pol et al., 2020).

Epistaxis (nose bleed) should be treated as sitting with the head leaned forward, reassurance, and two-finger compression of the nostrils for at least five minutes. After the squeeze is released, the reduction must be reapplied if the bleeding has not ceased. Any time the blood

When there is severe bleeding, a rolled gauze pad moistened with petroleum jelly or hydrogen peroxide is utilized while the patient is taken to a medical facility (Grønfeldt et al., 2020).

- *Hemoptysis (blood from the bronchi or lungs):* place the patient in a semisitting position (sitting with the back slightly leaned back), apply ice to the chest, keep the material released after coughing fits, and go to a medical facility. Place the affected person in the supine posture (lying face up while sleeping) and apply ice to the belly if they are experiencing hematemesis (blood coming from the digestive tract into the mouth).
- Rectal bleeding from the anus requires an absorbent bandage since the blood is vivid crimson. If they are melena, the feces are black and vile-smelling, necessitating an immediate transfer to the hospital.
- Vaginal bleeding: If severe, speak with a medical expert.
- Hematuria (blood in the urine): visit a medical facility immediately.

From those above, it must be noted that different types of hemorrhages require other treatments. Therefore, treatment for internal bleeding involves surgery and blood transfusion, whereas haemostatics, bandages, and local bleeding point compression are options for treating surface bleeding (Zideman et al., 2021).

On the other hand, they highlighted considerable bleeding as a significant source of bleeding by conducting a study on the procedures to be performed to control bleeding in emergency surgery correctly. Death in patients who are polytraumatized, have intra- or postoperative problems, or are experiencing a life-threatening emergency. They also stress the significance of providing the hemorrhage with sufficient care, which must involve stabilizing it, identifying it, repairing the lesion, and restoring tissue perfusion (Zheng et al., 2020).

CONCLUSION:

Based on the data sources examined in this study, it can be deduced that the vascular or circulatory system, composed of a network of blood vessels known as arteries, veins, and capillaries, is involved in all types of bleeding. As a result, vascular hemorrhage is connected to bleeding at any level of this system, which can result from a disease or follow trauma; therefore, its causes. The nature, motivation, and intensity of the bleeding will generally affect the symptoms and course of treatment for this illness; nevertheless, when treating severe bleeding, it is best to consider factors like stabilization, identification, lesion repair, and tissue perfusion recovery.

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