

Vamana Figures: An Artistic Representation of Achondroplasia and the Utility of Achondroplastic People as a theme to Artistically Illustrate the Concepts of *Vamana and Bhairava* (A Study based on Dwarf Carvings in India and Sri Lanka)

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Abstract: Dwarf carvings identified as Vamana or Bhairava figures are seen in both Indian and Sri Lankan contexts. Most of the artistry and the context of those carvings were appreciated by scholars. A focused, objective anthropometric assessment was not done because of interpreting Vamana figures. In the current study, Vamana carvings from different sites in India and Sri Lanka were examined. Upper body segment to lower body segment ratio was manually calculated in ten Vamana figures carved in standing position with minimal postural obliteration of segmental heights and preserved anatomical details. Specific observable clinical features of achondroplasia were also examined in the Vamana carvings. Calculated upper to lower body segment ratios of the selected Vamana figures were compared with that of achondroplasia and observed anatomical features of Vamana figures were correlated with clinical parameters of interest in achondroplasia. The mean value of the upper segment to lower segment ratios of the selected figures was 2.0. The upper to lower segment ratio of an adult person of average stature is 1.0 but in adults with achondroplasia, the ratio reaches 1.7 at skeletal maturity. Results of the study indicate that the range of upper segment to lower segment ratio of selected Vamana figures is between 1.8-2.27. This range and mean value are above the mentioned ratio for adults with achondroplasia indicating a short lower body segment. The current study's findings objectively justify that these Vamana figures are artistic representations of adults with achondroplasia, with a slight exaggeration of limb shortness compared to the upper segment to represent the intended population. The Vamana figures examined are an artistic representation of achondroplastic adults during ancient times. Rather than a depiction of hypothetical beings, achondroplastic adults engaged in security or guarding duties and aesthetic activities were retrospectively utilized as a theme to artistically illustrate the concepts of Vamana and Bhairava in literature.

Keywords: Vamana, Bhairava, Achondroplasia, Carvings

Introduction

The Vamana concept is extensively illustrated and discussed in the literature. Dwarf figures are seen in art forms including literature, sculpture, and paintings in both tangible and intangible forms worldwide. In works of art in the Western world, Greece, Egypt as well as China both proportionate and disproportionate dwarfism can be examined including works from the earliest times (www.italianartsociety.org, 2018; Kunze and Nippert, 1986; Daser, 1993; Emery and Emery, 1994; Friedlaender and Friedlaender, 2019; Wu *et al.*, 2021). Dwarf carvings identified as Vamana/ Bhairava figures are seen in both Indian and Sri Lankan contexts. Mostly the artistry and the content of those carvings were appreciated by scholars subjectively even with extreme interpretations. A focused objective anthropometric assessment was not done because of interpreting Vamana figures. The aim of the current study is firstly to objectively assess the upper body segment to lower body segment ratio which is used to assess and categorize the proportion of short stature, of selected Vamana figures alongside specific observable clinical features of achondroplasia and correlate them with clinical parameters of interest of achondroplasia, and secondly to explain how and why achondroplastic people have been utilized as the subject to artistically illustrate Vamana and Bhairava concepts in literature finally aiming to provide an objective interpretation to Vamana/Bhairava figures and their context and to provide an objective basis for preexisting and future interpretations on Vamana carvings.

Literature Review

The topic of skeletal dysplasia is widely discussed in the medical literature. Achondroplasia is a type of skeletal dysplasia which has drawn the attention of the scholarly population in various aspects including pathogenesis, genetics, diagnosis, prevalence and management. Vamana figures, in the form of carvings, can be identified in India and Sri Lanka. Vamana and Bhairava's concepts are also debated regarding dwarf carvings.

Achondroplasia

Stature is scientifically defined as the height of a person measured from the ground to the vertex of the head provided that the head is held in the Frankfurt horizontal plane. When the height of an individual is two standard deviations (SD) below the corresponding mean height for a given age, sex and population group that condition is defined as short stature (Ranke, 1996). Short stature can be broadly classified as proportionate short stature (PSS) and disproportionate short stature (DSS) based on differences in heights of axial skeleton and limbs which can be clinically assessed by upper to lower body segment ratio. PSS is diagnosed when the individual with short stature has the usual limbs and trunk height proportions, whereas, in short individuals with DSS, this proportion is absent and a great difference is seen in sitting and standing height. The lower segment is measured by measuring the distance from the top of the symphysis pubis to the floor by a vertical ruler. The upper segment is calculated by subtracting the lower segment value from the height measurement. The US/LS ratio was derived by dividing the upper by the lower segment (Turan *et al.*, 2007).

Achondroplasia is a rare genetic disorder identified as the most common non-lethal primary skeletal dysplasia and is the most common cause of short-limbed dwarfism in humans. This entity of skeletal dysplasia accounts for more than 90% of disproportionate short stature (Vajo, Francomano and Wilkin, 2000; Baujat *et al.*, 2008). The birth prevalence of achondroplasia has been estimated in several populations (Waller *et al.*, 2008; Moffitt *et al.*, 2011; Barbosa-Buck *et al.*, 2012; Stevenson

et al., 2012; Oberklaid *et al.*, 1979; Orioli *et al.*, 1995). Results of these studies (population-based or hospital-based assessments) show fairly consistent estimates and suggest that achondroplasia arises in about 1 in every 25,000–30,000 individuals with an estimated birth prevalence of 1 in 26,000–28,000 (Oberklaid *et al.*, 1979; Orioli *et al.*, 1995) which in turn is translated into around 250,000 affected persons worldwide (Waller *et al.*, 2008). Achondroplasia is caused by a point mutation in the gene coding for fibroblast growth factor receptor 3 (FGFR3) and is inherited in an autosomal dominant pattern (Horton, 2006). Due to this mutation increased inhibition of chondrocyte proliferation and differentiation occurs causing decreased endochondral bone formation in long bones (Laederich and Horton, 2010) (Shirley and Ain, 2009). Achondroplasia is characterized by short stature, macrocephaly with frontal bossing or broad forehead (Bouali and Latrech 2015), midface hypoplasia characterized by small depressed nasal bridge (Elwood *et al.*, 2003), Foramen magnum stenosis (Wigg *et al.*, 2016), maxillary hypoplasia (Shirley and Ain, 2009), upper limb rhizomelia -the proximal portion of the limb is shorter than distal portion (Shelmerdine *et al.*, 2016), short digits with a prominent gap between the ring and middle fingers which is known as a “trident hand” (Ornitz and Legeai-Mallet, 2017), thoracolumbar kyphosis (Kopits, 1988), lumbar hyperlordosis and bowed legs (Kopits Se, 1980). The torso size is average in affected individuals yet short limbs manifested as sitting height of within normal limits, but standing height often below the 5th percentile.

According to Hoover-Fong *et al* the ratio of upper to lower body segments for children of average stature is 1.4 at birth which decreases to 1.0 by 10 years of age. In children with achondroplasia, the 50th percentile of upper to lower body segments ratio is 2.0, which decreases to only 1.7 at skeletal maturity (2008). Scientific evidence suggests that the cognitive function is normal in most persons with achondroplasia (Hecht *et al.*, 1991; Thompson *et al.*, 1999) though developmental delays, particularly motor delays, are common throughout the developmental period (Todorov *et al.*, 1981).

Vamana Figures

The term Vamana was used to refer to dwarf figures in literature belonging to Buddhist and Hindu traditions in various contexts. In the ancient literary source, these terms were almost always interpreted considering the physical characteristics (Alagiyawanna, 2004, pp.708–709; Hettiarachchi, 1974, p.239; Turner, 1966, p.673). In Hindu literature term Vamana avatar was cited to refer to the fifth incarnation of Lord Vishnu (Liyanage, 1996, p.278). Vamana concept is interchangeably cited as Bhairava and Gana also in the literature (Banerjee, 1956, pp. 573-576). Bhairavas are divided into eight groups according to their caste (Liyanage, 1996, p.27-28; Amarasekara, 1967, p.165). As Bhairavas are considered to possess the authority over lands it is known that Bhairava Pujas were held to prevent calamities from them and to protect them. The Bhairava concept was drawn together with the concept of Kuvera, who was the lord of wealth according to Buddhist and Hindu religious concepts, to be depicted in ancient carving art. Nine treasures are mentioned in literature which indicate Kuvera’s prowess called Nava Nidhis. Two of them were called respectively Śaṅkha Nidhi and Padma Nidhi and the two Bhairavas who hold guard positions are also called by the same names (Wimalawansa, 2003, p.98). According to the Practical Sanskrit Dictionary, the definition of Śaṅkha is a conch shell (as a wind instrument) and the definition of Padma is a lotus flower (Macdonell, 1929). Śaṅkha and Padma were carved in ancient carved panels and guard stones appreciating their physical attributes of dwarf traits. That was seen that the Śaṅkha and Padma were carved commonly with treasures with distinctive features each. That is worth highlighting the utility of the reputation acquired by Śaṅkha and Padma as protectors in ancient

art which is evident by depicting Śaṅkha and Padma around buildings and also in early guard stones (Muragala) (Manatunga, 2016). Use of the Bhairava concept in the context of protection is also seen in India as well which can be derived by examining Meghadūta (Sanskrit: मेघदूत Cloud Messenger) - a lyric poem written by Kālidāsa (Maha kavi Kalidasage Meghadutha, 1999, pp.116–118).

According to the archaeological evidence found so far, the earliest illustrations of dwarf figures have been found in the archaeological field of Sanchi, where these illustrations are seen in the portals built on the four sides to access the main stupa. Dwarf-like figures were carved in the eastern pantheon concerning carvings depicting the great renunciation and occasion when King Asoka came to worship the Mahabodhi. Dwarf figures which were carved exhibiting prominent dwarf features of interest can be seen Sanchi Archeological Complex in the place where the vertical pillars and the horizontal pillars of the western pantheon are connected. Four dwarf figures are standing on the top of the two vertical pillars facing the four directions. In these semi-naked figures, lower limbs were exceptionally short and the belly protruded out. In addition to physical attributes, these figures were carved and adorned with ornaments such as circular earrings, and necklaces (Vimalananda, n.d.; Meisey, 1892, pp.58–60; Marshall, 1918, pp.68–70). A similar representation can be seen in the pantheon of the third stupa (Mitra, 1984, pp.42–43). Among Aurangabad carvings of India Vamana figures can also be seen (Qureshi, 1998, pl XVII)

In Sri Lanka, Vamana/dwarf figures were carved in different spaces depicting different roles and statuses. Pilaster heads decorated with dwarf figures can be seen in Mayura Pirivena, Medirigiriya Vatadage, Lankaramaya, Jetawanaya, Abhayagiriya and Lowamahapaya (Lakdusinghe, 1998, p.388). In Polonnaruwa Vatadage (Rotunda) and Polonnaruwa Lankathilaka temple Vamana figures can be examined (Basnayaka, 1998, pp.350–351). In the Polonnaruwa period, the decoration of the cross columns of the building bases by dwarf figures became more popular. These types of decorations can be seen on the outer walls of Thiwanka Image House/ Thiwanka Pilimageya (Wickramasinghe, 2012, pp.125–126) and in a basement column of the Raja Vaisasa Bhujanga Mandapam, the Rajasabha Mandapam of Parakrama-Bahu I. Two slabs on the image house `prathimagruha` base of the Niyamgampaya temple belonging to the Gampala period are also seen with carvings of dwarf figures cast from stone which show dwarf figures engaged in various aesthetic activities namely one playing a hand drum, one playing a Hakgediya- a type of conch shell which is used as a kind of trumpet, one playing a drum and two seem to perform a drama act (Piyananda, 1997, p.54) A dwarf figure from the palace of Anuradhapura which was carved with lots of necklaces was thought to show opulence and wealth (Wijesekara, 2015, p.281). During the fourth stage of the development of the Muragala/ Guard stone, before the development of the Nagaraja image, its entire space was lined by Vamanas (Amarasekara, 2017).

According to literature resources in India, Kuvera owns two maritime treasures known as Śaṅkha Nidhi and Padma Nidhi which were respectively on the right side and the left side of the Kuvera. With the probable influence of this belief, Śaṅkha Bhairava was used to depict on the right-sided guard stone as a dwarf figure with a skull cap carved conch shell shaped while Padma Bhairava on the left guard stone with the skull cap carved lotus-shaped (Wickramagamage, 1995, p.25; Lakdusinghe, 1998, p.388). On the return columns of the Kantaka Chethiya in Mihinthala a set of carved dwarf figures with dancing demeanour can be seen (Lakdusinghe, 1998, p.388). According to Wickramasinghe the face and head of one of these dwarf figures resemble features of a mask rather than that of the normal human face (2007, pp. 136-138). Amongst several engravings displayed in the Isurumuni museum, one panel which is considered to belong to 6-8 century BC includes an image of a dwarf figure with dancing postures.

Steps of the entrance of the Panchawasa complex which is called “Bisomaligaya” are decorated with more naturalistically represented dwarf figures where fine details of ornaments can be examined. Female dwarf figures can also be observed in the left guard stone of the Polonnaruwa vantage building’s southern gate and among dwarf figures carved in the outer wall of the Thivanka image house. Two female dwarf figures, though typical features of interest are lacking can be seen accompanying a female with normal physical attributes in the Koravakgala structure of the gate of Polonnaruwa Lankathilaka image house. In the same location, another female dwarf figure was carved with a dancing pose.

Globally history provides evidence of collecting, indulging and abusing dwarfs and sending them as gifts by royalty in courts of Egypt through the 18th century. In Egyptian courts, dwarfs were offered roles as priests and courtiers, jewellers and keepers of linen and toilet objects. In all periods dwarfs were employed to amuse others. Evidence of kings of ancient nations sending emissaries far to gather dwarfs can be identified in the literature (Adelson, 2005).

Methodology

Firstly, a thorough literature survey was conducted at two levels to evaluate methods of assessing stature mainly focusing on disproportionate short stature. The historical background of Vamana figures in India and Sri Lanka was explored thoroughly. To conduct the literary survey, online databases, university libraries, and personal repositories were consulted. For the sake of comprehensiveness, onsite visits were carried out. Experts in relevant fields were contacted over the phone and in-person interviews were also conducted. Dwarf figures carved in standing position with minimal postural obliteration of segmental height and with preserved anatomical details whose segmental ratio can reliably be assessed were included in the study. The upper segment to lower segment ratio was assessed in Vamana figures of vertical pillars of the gateway of the number three stupa of Sanchi, the northern vertical pillar of the gateway of the number one stupa of Sanchi, Padma guard stone at Abhayagiri Vihara Anuradhapura, guard stone Rajagiri Lena at Mihinthalaaya, Padma guard stone of so-called palace of I Vijayabahu at Anuradhapura, Śaṅkha guard stone of so-called palace of I Vijayabahu at Anuradhapura, No 3 Guard stone at Archeological Museum, Anuradhapura, Padma Nidhi Guard stone at “Mahasen Maligaya”, Abhayagiriya, Anuradhapura and Śaṅkha Nidhi Guard stone at “Mahasen Maligaya”, Abhayagiriya, Anuradhapura. To maintain the reliability and consistency of results, figures carved in a seated position or in specific postures where segmental heights cannot be reliably assessed, as well as figures with significantly obliterated anatomical features, were excluded from upper-to-lower segment ratio measurement. In addition, a subjective interpretation was provided to such figures found in Lowamahapaya, Madirigiriya Vatadage, Lankaramaya, Polonnaruwa Vatadage, Koravakgala construction, outer walls of Polonnaruwa Thiwanka Image House, basement of Rajawaishya-Bhujanga-Mandapaya Polonnaruwa, return columns of Mihinthalaaya Kantaka Chethiya premises, door frames of Devundara Devalaya- The Fane Of Devundara, stairs of Bisomaligaya, Niyangampaya patimagruha basement and a pantheon of Gadaladeniya Vihara based on visually identifiable clinical features including comparative sizes of limbs and other physical characteristic of this disorder including large head, prominent forehead, depressed nasal bridge, maxillary hypoplasia, lumbar hyperlordosis which is manifested as the belly is extensively protruding out and bowed legs as extensively discussed in preceding sections. Colour photographs were converted to the grey scale to enhance easy visualization of features. Images were enlarged and printed. As the measurement is a ratio, height and upper segment were measured using the vertical ruler and to lower segment ratio

was manually calculated (upper segment height/ total height-upper segment height). In all figures, the possible highest point of the head was marked after visually excluding the additional added height attributed to the headdress. Level of feet marked. Level of the pubic symphysis was determined by examining dress lines and visually identifiable possible level of anterior superior iliac spine. To maintain consistency, all levels were marked in the same plane, parallel to each other. The level at which the 1:1 upper segment to lower segment ratio achieved was indicated separately. Following manual assessment printed images were scanned included as JPEG images.

Results and Discussion

Table 1: Measured heights, upper segment and lower segment measurements and upper to lower body segment ratio calculations

| <i>Sample number</i> | <i>Vamana figure</i> | <i>Height measurement</i> | <i>Upper segment measurement</i> | <i>Lower segment measurement</i> | <i>Upper segment to lower segment ratio</i> |
|----------------------|---|---------------------------|----------------------------------|----------------------------------|---|
| Figure 1 | Vamana figure of one vertical pillar of gateway of number three stupa of Sanchi | 5.8cm | 3.8cm | 2cm | 1.90 |
| Figure 2 | Vamana figure of one vertical pillar of gateway of number three stupa of Sanchi | 6.4 cm | 4.2cm | 2.2cm | 1.90 |
| Figure 3 | Vamana figure Guard stone Rajagirilena Mihinthalya | 6.3cm | 4.2cm | 2.1cm | 2.04 |
| Figure 4 | Vamana figure of northern vertical pillar of gateway of number one stupa of Sanchi. | 8.4cm | 5.4cm | 3.0cm | 1.80 |
| Figure 5 | Vamana figure Padma Guard stone at Abhayagiri Vihara Anuradhapura | 10.8cm | 7.5cm | 3.3cm | 2.27 |
| Figure 6 | Vamana figure Padma Guard stone of so called palace of I Vijayabahu at Anuradhapura. | 10.5cm | 7.0cm | 3.5cm | 2.00 |
| Figure 7 | Vamana figure Śaṅkha Guard stone of so called palace of I Vijayabahu at Anuradhapura. | 9.0cm | 5.9cm | 3.1cm | 1.90 |
| Figure 8 | Vamana figure Padma Nidhi Guard stone at “Mahasen Maligaya”, Abhayagiriya, Anuradhapura | 10.8cm | 7.5cm | 3.3cm | 2.27 |
| Figure 9 | Vamana figure No 3 Guard stone at Archeological Museum, Anuradhapura. | 9.5cm | 6.4cm | 3.1cm | 2.06 |
| Figure 10 | Vamana figure śaṅkha Nidhi Guard stone at “Mahasen Maligaya”, Abhayagiriya, Anuradhapura. | 8.0cm | 5.5cm | 2.5cm | 2.20 |

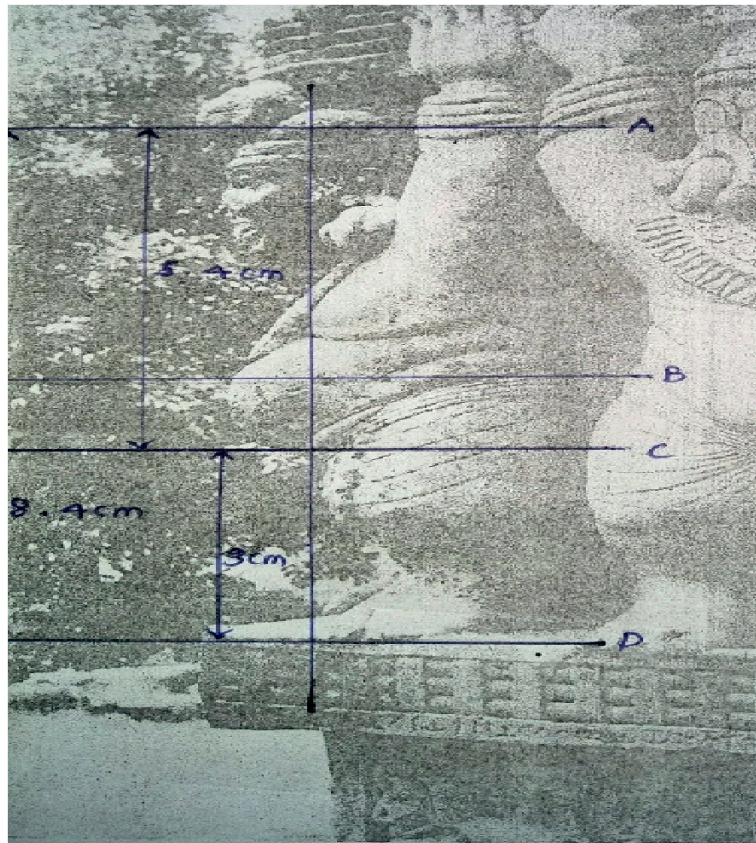


Figure 1: Manual measurement of height, upper segment and lower segment of printed enlarged gray scale image of Vamana figure of northern vertical pillar of gateway of number one stupa of Sanchi

The mean value of the upper segment to lower segment ratios of the selected figures was 2.03. The upper to lower segment ratio of an adult person of average stature is 1.0 but in adults with achondroplasia the ratio reaches 1.7 at skeletal maturity (Hoover-Fong *et al*, 2008). Results of the study indicate that the range of upper segment to lower segment ratio of selected Vamana figures is between 1.8-2.27. This range and mean value are above the mentioned ratio for adults with achondroplasia. The current study's findings objectively justify that these Vamana figures are artistic representations of adults with achondroplasia, with slight exaggeration of limb shortness compared to the upper segment to clearly represent the intended population.

Kalidasa, in his *Megaduta*, in the description to the cloud messenger, of the characteristics of the mansion where the beloved of the exiled yaksha was pining for her absent lord in the fairy land of Alaka, two features by which the cloud messenger would have identified his target were the forms of Śaṅkha and Padma painted on either side of the wall of the doorway (Kale, 1934, pp.200–202). Representations of Śaṅkha and Padma motifs, both as actual conch shells and lotuses in early representations of the third and fourth centuries A.D. and as dwarf figures have been found at various sites in India including marble carvings of the Ikshvaku period, Chalukyan temples and specimens from Kaveripakkam (Sivaramamurti, 1999, p.11). Personification of Śaṅkha Nidhi and Padma Nidhi has been mentioned in South Indian texts on iconography as figures with short limbs attached to a large trunk (Rao, 1997, p.536). Silpa-sastras have also provided a nearly similar account on Śaṅkha Nidhi and Padma Nidhi. According to Wickramasinghe the face and head of one of these dwarf figures resemble the features of a mask rather than those of a normal human face (2007,

pp. 136-138). This opinion would have emerged due to the aforementioned syndromic features of achondroplasia.

As extensively discussed above though achondroplastic adults have disproportionate short stature, their cognitive development is not significantly affected by the disease condition (Hecht *et al.*, 1991; Thompson *et al.*, 1999) thus making an adult with achondroplasia a short with average cognitive function and according to various studies achondroplasia arises in about 1 in every 25,000–30,000 individuals (Waller *et al.*, 2008; Moffitt *et al.*, 2011; Barbosa-Buck *et al.*, 2012; Stevenson *et al.*, 2012; Oberklaid *et al.*, 1979; Orioli *et al.*, 1995; Oberklaid *et al.*, 1979). That can be postulated that they were considered more proficient in guard duties due to special perquisites gained by them from their specific physical attributes in the presence of normal cognitive functions.

There is evidence in the literature that Dwarfs have been assigned to protect the people of Zenana. Buthsarana mentions dwarf people in kings' palaces (Lankananda, 1968, p.316). Inscriptions provide details of the guards of the same kind (Vimalawansa, 2016, p.32). The chance of standing unnoticed compared to adults with average stature would be high and they could hide easily due to their short physical attributes. They can be deployed in comparatively minute spaces. As the definitive terminal space where a treasure is hidden was traditionally a smaller place during ancient times those achondroplastic guards might have been employed in such places for dedicated protective assignments i.e. a small chamber with the treasure inside a large facility like a cave, a pagoda or underground bunkers. The real-time employment of people with achondroplasia in security tasks throughout history might have stimulated sculptors and carving artists to consider achondroplastic population as a proposition for carvings of dwarf figures called Vamana figures.

Taking four dwarf figures of the western pantheon of Sanchi Archeological Complex-India into consideration which were carved standing on the top of the two vertical pillars facing the four directions, it can be logically postulated that those Vamana figures were an artistic expression of an already existing tradition of deploying achondroplastic guards in service chambers of pantheons and gates rather than carving them in the form of carrying the whole weight above them. The explanation that Vamana figures have been carved in such instances in the form of carrying or holding the weight does not give a valid explanation for why a Vamana figure should carry the whole weight above them.

In the Sri Lankan context, a similar postulation can be advanced to explain how Vamana figures entered the carvings of Sri Lanka. According to Wijesekara, the development of indigenous arts and crafts may not have been entirely free from direct or indirect conflict with the dominant influence of the cultural and social forces of the neighbouring continent, India. Therefore, it is justified to consider that this subject of sculpture is inspired by Indian concepts and techniques (2005, p1). Technically multiple strategic political and cultural invasions of ancient Sri Lanka can be identified by examining resources. Arahath Mahinda thero advised King Devanampiyatissa regarding the shape of the pagoda when asked (Wanarathna, 1986, p. 179) . The Arahath nun Sangamiththa visited Ceylon with a branch of the Maha Bodhi tree and she was accompanied by various skilled craftsmen of several clans and also statesmen (Ven. Mahanama Maha Thero, 2015, p. 81; Ven. Buddha Puthra Thero, 1953, pp. 825–826; Ven. Vilgammula Sangharaja Thero, 2018, p.282). A powerful Tamil invader from South Indian Soli country, named Elara (205 - 181 BC) conquered the northern kingdom and ruled the country for 47 years.

King Dutugemunu (161 - 137 BC) who defeated King Elara built several beautiful monuments, some of which are preserved even today with artistic scenes of the highest Indian tradition (Wijesekara 2015 p 107). It is mentioned in a Sangam-era Tamil epic that King Gajabahu was present during the

festivals held in the temples of Goddess Pattini in the Chera capital (Silappadikaram 305–315). During the Mamalla period (AD 25 - 650) there was indelible evidence of connection with the Pallavas which was evident by rock carvings in Isurumuniya (Wijesekara 2015 p 109). Cola king first Raja Raja invaded Ceylon during the period of King Fifth Mihindu, who reigned in Anuradhapura, whose son named Rajendra I (1017-18 AD) completed the conquest. Then Polonnaruwa became the capital under the Colas and was named Jananatha-Mangalam. According to Sasthri, Raja-Raja probably signaled the Cola occupation of Ceylon by the construction of a stone temple of Siva- the Siva-Devale in Polonnaruwa where South Indian architectural influence was strongly appreciated (1955, pp.172–173). This evidence supports the aforementioned notion of Indian influence on the ancient art culture and tradition of Ceylon.

The context of Vamana figures seen in pilaster heads found in Mayura Pirivena, Medirigiriya Vatadage, Lankaramaya, Jetawanaya, Abhayagiriya and Lowamahapaya can also be explained by the logical suggestion proposed for Vamana figures carved in pantheons of Sanchi. During the fourth stage of development of Muragala/ Guard stone, before the development of the Nagaraja image, its entire space was lined by Vamana figures. This depiction strongly suggests the fact that achondroplastic adults had a greater reputation as guards. In Meghadutha kuvera was described as an ugly being with short stature, three legs and an extremely protuberant belly but features of Śaṅkha and Padma were not mentioned (Amarasekara, 1967, p.165). Since achondroplastic adults might have been assigned as guards of treasures in ancient times by comparably prosperous masters to have achondroplastic or dwarf guards to appoint as immediate guards of treasures, engravers might have initiated the tradition of sculpting Vamana/achondroplastic figures to structurally illustrate the concept of Śaṅkha Nidhi and Padma Nidhi. According to Kulathunga, there is a notion that the dwarf figures seen in the relic mansion- Dhāthu Mandiraya building of Abhayagiriya monastic complex were the people shielded the premises as guards. (2014, p.560)

Dwarf figures carved in dancing-like poses can be seen in places like Niyamgampaya, Karnataka Chethiya in Mihinthalaaya, an engraving panel displayed in Isurumuni museum and Polonnaruwa Lankathilaka image house premises. Figures carved as dwarfs playing instruments and performing a drama act are seen in Niyamgampaya. Those depictions lead us to assume that the achondroplastic adults were engaged in entertainment activities. In the modern era, dwarfs are also performing in circuses (The J. Paul Getty Museum Collection, n.d.). Due to their highlighted physical attributes, they might have drawn the attention of the audience. Their ability to entertain others with such activities can be partially explained by their average cognitive function. With the rarity of the achondroplastic people having a group of them might be considered a privilege by monarchs.

Vamana figures found in Lowamahapaya, Madirigiriya Vatadage, Lankaramaya, Polonnaruwa Vatadage, Korawakgala construction, outer walls of Polonnaruwa Thiwanka Image House, basement of Raja-Waishya-Bhujanga-Mandapaya, Polonnaruwa, return columns of Mihinthalaaya Kantaka Chethiya premises, door frames of Devundara Devalaya- The Fane Of Devundara, stairs of Bisomaligaya, Niyamgampaya patimagruha basement and a pantheon of Gadaladeniya Vihara show comparatively short limbs, lumbar hyperlordosis which is manifested as the belly extensively protruding out, large head and distorted facial features to various extents. Therefore, those figures can also be considered as an artistic representation of achondroplasia.

The face and head of one of the dwarf figures in the “Bisomaligaya” complex resemble features of a mask rather than those of a normal human face (Wickramasinghe, 2007, pp.136–137). This opinion would have emerged due to the aforementioned syndromic features of achondroplasia.

Disproportionateness of the limb and torso lengths of Vamana figures of interest can be compared in places where dwarf figures are carved with figures of normal average stature. Comparably short figures of Vamana form in Guard stones at Vatadage, Polonnaruwa and guard stone seen at Ratnaprāsādaya, Polonnaruwa can be compared with the body proportions of the Nagaraja figure carved with where limb and torso lengths of dwarf figures were seen disproportionate while Nagaraja was carved maintaining proportions. This observation fortifies the notion that the Vamana figures are an artistic representation of achondroplasia. Carvings of female dwarf figures and dwarf-like figures indirectly promote the fact that those carvings were an artistic expression of achondroplasia persons rather than female figures of imaginary beings. For sculptors, it was not difficult to artistically represent actual living beings which is evident by examining female Vamana-like figures sculpted on the Korawakgala construction of the gate of Polonnaruwa Lankathilaka Image House where those figures carved as two dwarf figures escorting a noblewoman in which comparative indication of heights can be seen.

That must be stated carefully that all carvings with short stature do not represent typical achondroplasia. This category of carvings can reliably be named Vamana-like/achondroplasia-like figures. The characteristics of Vamana-like figures can be attributed to modifications made by ancient artists to representations of initial figures or modified figures carved artistically editing typical features of the objective population. This is evident by examining Vamana-like figures including the figure in Kantaka Chethiya Mihinthala where the belly is not protruding out but rather sagging down. The sculptor might have intentionally reduced the conspicuousness of the protruding belly to protect his perspective.

Conclusion

The Vamana figures examined are an artistic representation of achondroplastic adults during ancient times. Rather than a depiction of hypothetical beings, achondroplastic adults engaged in security or guarding duties and aesthetic activities were retrospectively utilized as a theme to artistically illustrate the concept of Vamana and Bhairava in literature.

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References

- Agravala, K.B. (1996). *Photographs of Vamana Figures of a Pantheon of Stupa 3 Sanchi*.
- Alagiyawanna, P. (2004). *Alagiyawanna sanskrutha Sinhala shabdhakoshaya*. maradana: Sooriyaparakashakayo, pp.708–709.
- Amarasekara, D. (1967). *Ape Devi Dewathawo*. Colombo: M.D. Gunasena and corporation, p.165.
- Amarasekara, S. (2017). *An Introduction to the Concept and Evolution of the Guard Stone and Its Architectural Visualization of the Contemporary Religious and Cultural Diversities*. Journal of Arts and Humanities, 6(3), p.52. doi:10.18533/journal.v6i3.1135.
- Adelson, B. (2005). *Dwarfs: The Changing Lives of Archetypal 'Curiosities' — and Echoes of the Past*. Disability Studies Quarterly, 25(3). doi:10.18061/dsq.v25i3.576. (Adelson, 2005

- Barbosa-Buck, C.O., Orioli, I.M., da Graça Dutra, M., Lopez-Camelo, J., Castilla, E.E. and Cavalcanti, D.P. (2012). *Clinical epidemiology of skeletal dysplasias in South America*. *American Journal of Medical Genetics. Part A*, [online] 158A (5), pp.1038–1045. doi:10.1002/ajmg.a.35246.
- Baujat, G. *et al.* (2008) *Achondroplasia, Best Practice & Research Clinical Rheumatology*, 22(1), pp. 3–18. Available at: <https://doi.org/10.1016/j.berh.2007.12.008>.
- Basnayaka, H.T. ed., (1998). *Ape Sanskruthika Urumaya*. Colombo: Central Cultural Fund, pp.350–1.
- Banerjea, J.N. (1956). *The Development of Hindu Iconography*. Calcutta: Munshiram Manoharlal, pp.573–6.
- Dasen, V. (2013). *Dwarfs in ancient Egypt and Greece*. Oxford: Oxford University Press.
- Emery, A.E. and Emery, M. (1994). *Genetics in art*. *Journal of Medical Genetics*, 31(5), pp.420–2. doi:10.1136/jmg.31.5.420.
- Elwood, E.T. *et al.* (2003) *Midface Distraction to Alleviate Upper Airway Obstruction in Achondroplastic Dwarfs*, *The Cleft Palate-Craniofacial Journal*, 40(1), pp. 100–3. Available at: https://doi.org/10.1597/1545-1569_2003_040_0100_mdttau_2.0.co_2.
- Friedlaender, G.E. and Friedlaender, L.K. (2019). *Art in Science: Velázquez and Dwarfism—The Art of Observation*. *Clinical Orthopedics & Related Research*, 478(1), pp.31–3. doi:10.1097/corr.0000000000001076.
- Oover-Fong, J.E. *et al.* (2008) *Age-appropriate body mass index in children with achondroplasia: interpretation in relation to indexes of height*, *The American Journal of Clinical Nutrition*, 88(2), pp. 364–371. Available at: <https://doi.org/10.1093/ajcn/88.2.364>.
- Horton, W.A. (2006) *Recent milestones in achondroplasia research*, *American Journal of Medical Genetics Part A*, 140A (2), pp. 166–9. Available at: <https://doi.org/10.1002/ajmg.a.31029>.
- Houda Bouali and Hanane Latrech (2015) *Achondroplasia: Current Options and Future Perspective.*, *Pediatric Endocrinology Reviews*, 12(4), pp. 388–95. Available at: <https://pubmed.ncbi.nlm.nih.gov/26182483/>.
- Hettiarachchi, D.E. ed., (1974). *Dampiyaatuwagetapadaya*. Sri Lanka University Press, p.239.
- Hecht, J.T., Thompson, N.M., Weir, T., Patchell, L. and Horton, W.A. (1991). *Cognitive and motor skills in achondroplastic infants: Neurologic and respiratory correlates*. *American Journal of Medical Genetics*, 41(2), pp.208–11. doi:10.1002/ajmg.1320410215.
- Kale, M.R. (1934). *The Megaduta of Kalidasa with the Commentary of Mallinatha*. 3rd ed. Bombay: D.V & B.D MULGAOKAR, pp.200–2.
- Kulathunga, T.G. (2014). *Purāna Abhayagiri Viharaya*. Colombo: Central Cultural Fund, p.560.
- Kunze, J. and Nippert, I. (1986). *Genetics and Malformations in Art*. Grosse Verlag.
- Kopits Se (1980) *Genetics clinics of The Johns Hopkins Hospital. Surgical intervention in achondroplasia. Correction of bowleg deformity in achondroplasia.*, *The Johns Hopkins Medical Journal*, 146(5), pp. 206–9. Available at: <https://pubmed.ncbi.nlm.nih.gov/7382244/>.
- Kopits, S.E. (1988) *Thoracolumbar Kyphosis and Lumbosacral Hyperlordosis in Achondroplastic Children*, *Human Achondroplasia*, pp. 241–55. Available at: https://doi.org/10.1007/978-1-4684-8712-1_34.
- Laederich, M.B. and Horton, W.A. (2010) *Achondroplasia: pathogenesis and implications for future treatment*, *Current Opinion in Pediatrics*, 22(4), pp. 516–23. Available at: <https://doi.org/10.1097/mop.0b013e32833b7a69>.
- Lakdusinghe, S. ed., (1998). *Ape Sanskruthika Urumaya*. Colombo: Central Cultural Fund, p.388.
- Liyanage, S. (1996). *Janavidya shabdhakoshaya*. Colombo: As Godage and Sayodarayo, p.278.

- Mitra, D. (1984). *Sanchi*. 5th ed. Archaeological Survey of India, pp.42–3.
- Moffitt, K.B., Abiri, O.O., Scheuerle, A.E. and Langlois, P.H. (2011). *Descriptive epidemiology of selected heritable birth defects in Texas. Birth Defects Research Part A: Clinical and Molecular Teratology*, 91(12), pp.990–4. doi:10.1002/bdra.22859.
- Marshall, J. (1918). *A guide to Sanchi*. Calcutta: Superintendent Government Printing India, pp.68–70.
- Meisey, F.C. (1892). *Sanchi and its remains*. London: Kegan Paul, Trench, Trübner and co Ltd. Charing cross road, pp.58–60.
- Patric, N.(1999). *Maha kavi Kalidasage Meghadutha*. Colombo: As Godage and Sayodarayo, pp.116–8.
- Macdonell, A.A. (1929). *A Practical Sanskrit Dictionary with Transliteration, Accentuation, and Etymological Analysis Throughout*. [online] dsal.uchicago.edu. Available at: https://dsal.uchicago.edu/cgi-bin/app/macdonell_query.py?page=306 [Accessed 15 Feb. 2022].
- Manatunga, D.K. (2016). *THE HISTORICAL EVOLUTION AND PRESENT USAGE OF THE GUARD STONES IN ANCIENT SRI LANKA*. *Humanities and Social Sciences Review*, 5(3), pp.17–22.
- Orioli, I.M., Castilla, E.E., Scarano, G. and Mastroiacovo, P. (1995). *Effect of paternal age in achondroplasia, thanatophoric dysplasia, and osteogenesis imperfecta*. *American Journal of Medical Genetics*, 59(2), pp.209–17. doi:10.1002/ajmg.1320590218.
- Oberklaid, F., Danks, D.M., Jensen, F., Stace, L. and Rosshandler, S. (1979). *Achondroplasia and hypochondroplasia. Comments on frequency, mutation rate, and radiological features in skull and spine*. *Journal of Medical Genetics*, 16(2), pp.140–6. doi:10.1136/jmg.16.2.140.
- Ornitz, D.M. and Legeai-Mallet, L. (2017) *Achondroplasia: Development, pathogenesis, and therapy*, *Developmental Dynamics*, 246(4), pp. 291–309. Available at: <https://doi.org/10.1002/dvdy.24479>.
- Piyananda, A. (1997). *Gampala Yugaye Prathima Shilpaya*. Central Cultural Fund and Religious and Cultural Affairs Department, p.54.
- Perera, A.D.T.E. (1991). *Sinhala encyclopedia*. Government Press, Cultural Department, pp.534–535.)
- Rao, G. (1997). *Elements of Hindu iconography*. Delhi: Motilal Banarsidass, p.536.
- Ranke, M.B. (1996) *Towards a Consensus on the Definition of Idiopathic Short Stature*, *Hormone Research*, 45(2), pp. 64–6. Available at: <https://doi.org/10.1159/000184851>.
- Stevenson, D.A., Carey, J.C., Byrne, J.L.B., Srisukhumbowornchai, S. and Feldkamp, M.L. (2012). *Analysis of skeletal dysplasias in the Utah population*. *American Journal of Medical Genetics Part A*, 158A (5), pp.1046–1054. doi:10.1002/ajmg.a.35327.
- Shelmerdine, S.C. *et al.* (2016) *Achondroplasia: Really rhizomelic?*, *American Journal of Medical Genetics Part A*, 170(8), pp. 2039–2043. Available at: <https://doi.org/10.1002/ajmg.a.37776>.
- Shirley, E.D. and Ain, M.C. (2009) *Achondroplasia: Manifestations and Treatment*, *Journal of the American Academy of Orthopedic Surgeons*, 17(4), pp. 231–41. Available at: <https://doi.org/10.5435/00124635-200904000-00004>.
- Sivaramamurti, C. (1999). *Memories of the Archaeological Survey of India No 73 Sanskrit Literature & Art Mirrors of Indian Culture*. New Delhi: The director general archaeological survey of India, p.11.
- Adigal, I. (1939). *Silappadikaram*. Translated by V. R. R. Dikshithar, Madras, Oxford University Press IndiaBranch, pp. 305–15.
- Sasthri, N. (1955). *the Colas*. 2nd ed. Madras: University of Madras, pp.172–173.

- Thompson, N.M., Hecht, J.T., Bohan, T.P., Kramer, L.A., Davidson, K., Brandt, M.E. and Fletcher, J.M. (1999). *Neuroanatomic and neuropsychological outcome in school-age children with achondroplasia*. *American Journal of Medical Genetics*, [online] 88(2), pp.145–53. doi:[https://doi.org/10.1002/\(sici\)1096-8628\(199904\)88:2%3C145::aid-ajmg10%3E3.0.co;2-b](https://doi.org/10.1002/(sici)1096-8628(199904)88:2%3C145::aid-ajmg10%3E3.0.co;2-b).
- Todorov, A.B., Scott, C.I., Warren, A.E., Leeper, J.D. and Opitz, J.M. (1981). *Developmental screening tests in achondroplastic children*. *American Journal of Medical Genetics*, 9(1), pp.19–23. doi:10.1002/ajmg.1320090105.
- Turan, S. *et al.* (2007) *Upper segment/lower segment ratio and arm span-height difference in healthy Turkish children*, *Acta Paediatrica*, 94(4), pp. 407–13. Available at: <https://doi.org/10.1111/j.1651-2227.2005.tb01909.x>.
- Turner, R.L. (1966). *A Comparative Dictionary of the Indo-Aryan Languages*. London: Oxford University Press, p.673.
- Vajo, Z., Francomano, C.A. and Wilkin, D.J. (2000) *The Molecular and Genetic Basis of Fibroblast Growth Factor Receptor 3 Disorders: The Achondroplasia Family of Skeletal Dysplasias, Muenke Craniosynostosis, and Crouzon Syndrome with Acanthosis Nigricans*, *Endocrine Reviews*, 21(1), pp. 23–39. Available at: <https://doi.org/10.1210/edrv.21.1.0387>.
- Vimalananda, P. (n.d.). *The Glory of Sanchi*. The Shell company of Ceylon, Ministry of Cultural Affairs, plate no XIX, XX.
- Vimalakirithi Thero, M. and Sumangala Thero, K. eds., (2008). *Gurulugominge Dharmapradipikawa*. Colombo 10: Rathna Book Publishers, pp.351–58.
- Mahanama.(2015). *Mahavamso-sinhala*. 2nd ed. Dehiwala: Buddhist Cultural Centre, p.81.
- Buddaputhra.(1953). *Pujavaliya*. maradana: Rathna Publishers, pp.825–826.
- Sangharaja, V.(2018). *Sinhala Bodhi Wanshaya*. mardana: Rathna Publishers, p.282.
- Wanarathna, R. ed., (1986). *Sinhala Thupawanshaya*. maradana: Samayawardana Bookshop private limited, p.179.
- Wickramasinghe, M. (2012). *Kalunika Sevima*. Sarasa publishers, pp.125–26.
- Wickramasinghe, M. (2007). *Eththayuththa*.Rajagiriya: Sarasa pvt.ltd, pp.136–37.
- Wu, L., Zhou, Y., Zhang, D., Shen, Y. and Liu, A. (2021). *The portrayal of people with dwarfism in Chinese art*. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics*, 187(2), pp.192–98. doi:10.1002/ajmg.c.31906.
- Waller, D.K., Correa, A., Vo, T.M., Wang, Y., Hobbs, C., Langlois, P.H., Pearson, K., Romitti, P.A., Shaw, G.M. and Hecht, J.T. (2008). *The Population-Based Prevalence of Achondroplasia and Thanatophoric Dysplasia in Selected Regions of the US*. *American journal of medical genetics*. Part A, [online] 146A (18), pp.2385–9. doi:10.1002/ajmg.a.32485.
- Wickramagamage, C. (1995). *Sri Lankawe Parani Godanagili Doratu*. Maharagama: Tharanji Printers, p.25.
- Wijesekara, N. (2015). *EARLY SINHALESE SCULPTURE*. Colombo 10: S. Godage and brothers pvt. ltd, pp.1, 107, 109, 281.
- Wimalawansa, B. (2003). *Sankya Shabdakoshaya*. Colombo: S Godage and brothers, p.98.
- Wigg, K. *et al.* (2016) *The neuropsychological function of children with achondroplasia*, *American Journal of Medical Genetics Part A*, 170(11), pp. 2882–8. Available at: <https://doi.org/10.1002/ajmg.a.37779>.
- www.italianartsociety.org. (n.d.). *Dwarfism in Italian Renaissance and Baroque Painting – Italian Art Society*. [online] Available at: <https://www.italianartsociety.org/2018/10/dwarfism-in-italian-renaissance-and-baroque-painting/> [Accessed 21 Jun. 2022].