MARCOS PAULO SALLES MACHADO

ANÁLISE RETROSPECTIVA DOS EXAMES REALIZADOS NO SERVIÇO DE ANTROPOLOGIA FORENSE DO INSTITUTO MÉDICO LEGAL AFRANIO PEIXOTO, RIO DE JANEIRO- BRASIL

RETROSPECTIVE ANALYSIS OF THE SKILLS PERFORMED IN THE FORENSIC ANTHROPOLOGY SERVICE OF THE AFRÂNIO PEIXOTO MEDICAL LEGAL INSTITUTE, RIO DE JANEIRO- BRAZIL

PIRACICABA
2015

Universidade Estadual de Campinas
Faculdade de Odontologia de Piracicaba

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Dissertação apresentada à Faculdade de Odontologia de Piracicaba da Universidade Estadual de Campinas como parte dos requisitos exigidos para obtenção do título de Mestre em Biologia Buco-Dental, na Área de Odontologia Legal e Deontologia

Dissertation presented to the Piracicaba School of Dentistry of the University of Campinas in partial fulfillment of the requirements for the degree of Master in Dental Biology in the Forensic Dentistry & Ethics area.

Orientador: Prof. Dr. Eduardo Daruge Junior

Este exemplar corresponde à versão final da dissertação defendida por Marcos Paulo Salles Machado e Orientada pelo Prof. Dr. Eduardo Daruge Junior.

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RESUMO

O objetivo deste trabalho foi realizar a análise retrospectiva dos casos investigados nos dois primeiros anos de funcionamento do Serviço de Antropologia Forense (SAFO) do Rio de Janeiro. Foram recebidas 66 requisições de exames expedidas por autoridades policiais ou judiciárias e cada requisição deu origem a um laudo. Seis requisições continham ossos de origem não humana, três representavam materiais sem interesse forense, enquanto uma outra requisição solicitava exame complementar. As demais 56 requisições continham ossos de 74 diferentes indivíduos, pois nove requisições encaminhavam ossos de mais de uma pessoa. Das 74 ossadas, cinco não deram entrada no laboratório do SAFO por terem sido identificados pelo Serviço de Odontologia Forense ou pelo Setor de Necropapiloscopia. Logo, 69 ossadas foram periciadas e o resultado desses exames compõe o presente estudo. Dentre as 56 requisições, 47 (83%) eram constituídas de remanescentes de um único indivíduo, enquanto 9 (17%) traziam ossos de mais de uma pessoa. Menos de 18.8% das 69 ossadas tiveram mais de 95% dos ossos do corpo recuperados, enquanto que apenas 10.14% das 47 ossadas encontradas completamente esqueletizadas tiveram mais de 50% dos seus ossos recuperados. O perfil biológico resultante dos exames das ossadas revelou que a amostra era predominantemente constituída por homens (80%), caucasoides (32%), adultos-jovens entre 21-50 anos (54%) constituindo o perfil populacional mais atingido. O mecanismo de ação mais frequentemente observado foi o contundente, correspondendo a 33.3% dos casos, seguido do perfurocontundente, observado em 31.4%. A região mais atingida foi a crânio-cervical, atingida em 42% dos traumas. A relação mais alta observada entre um tipo de trauma e uma região específica do corpo foi a ação perfurocontundente incidindo sobre a região crânio-cervical, correspondendo à 27.3%. 52.1% das ações perfurocontundentes foram observadas na região crânio-cervical. Por fim, a analise dos locais de encontro de ossadas evidenciou um grande número de casos reduzidos a poucas áreas da cidade, revelando que existe concentração da violência.

Palavras-Chave: Antropologia Forense; Odontologia Forense; Antropologia.

ABSTRACT

The aim of this study was to perform a retrospective analysis of the cases investigated in the first two years of the Forensic Anthropology Service (SAFO) of Rio de Janeiro. Over these two years the laboratory received 66 examination requisitions requested by police or judicial authorities and each of these requests has resulted in a report. Six corresponded to non-human material, other 3 represented material without forensic implications and another one corresponded to a complementary examination requisition. The remaining 56 requisitions comprised a total of 74 different individuals, once there were 9 cases with bones of more than one person. Five out of 74 skeletal remains did not enter the SAFO laboratory because they had been positively identified by the Forensic Dentistry Office or through Necropapiloscopy. Therefore 69 skeletal remains were examined and the resulting data compose the present study. Out of 56 requisitions, 47 (83%) presented skeletal remains of single individuals; whereas the other 9 (17%) conteined bones of more than one individual. Less than 18.8% of 69 skeletal remains recovered comprised more than 95% of body bones, wile only 10.14% of the 47 fully skeletonized remains had more than half of the bones recovered. The biological profile established after skeletal remains were investigated showed that the sample was made up mainly of male subjects (80%), caucasian (32%), young-adults ranging from ages 21-50 (54%), considered as the risk group. Injuries most frequently observed were blunt trauma (33.3%), followed by gunshot (31.4%). The most susceptible body regions were the head and neck, affected in 42% of cases. The highest correlation between type of trauma to a specific body part was observed with gunshot injuries to the head-neck region, corresponding to 27.3% of the cases. Gunshot trauma represented 52.1% of injuries found on the head and neck. Analysis of the places where the remains were recovered reveled a great number of cases restricted to a few areas of the city, which shows the violence is concentrated in these localities.

Keywords: Forensic anthropology; Forensic odontology; Anthropology.

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"É contrário à pureza de coração: a ciência enfatuada que não se transforma em vida, o estudo sem meditação, a meditação sem obras, a admiração sem imitação, o estudo egoísta que se compraz em si e jamais se sacrifica pelos outros."

São Francisco de Assis

INTRODUÇÃO

"*A perícia é a rainha das provas*". Esta consagrada expressão jurídica demonstra a importância da prova pericial nos processos criminais e se baseia, especialmente, no caráter imparcial que pressupõe a atividade pericial.

Além da imparcialidade, o rigor científico constitui outro pressuposto da rotina pericial. As técnicas utilizadas no ato pericial devem ter sido testadas e aprovadas pela comunidade científica e precisam ser reproduzíveis, à qualquer tempo, por qualquer indivíduo treinado que se disponha a rever o método[1]. Sendo assim, o perito é, antes de tudo, um indivíduo treinado, experimentado em determinada área do conhecimento humano.

A Antropologia Forense (AF) representa uma área do conhecimento humano que tem se aprimorado e se redescoberto, ao passar por grandes transformações nas últimas décadas [2–4]. No Brasil, só recentemente, a antropologia forense tem recebido a devida atenção nos institutos periciais. Somente alguns poucos estados possuíam um setor que cuidava especificamente da análise das ossadas[5,6] e, no âmbito acadêmico, eram raras as publicações específicas.

Lançar um olhar acadêmico sobre as atividades desenvolvidas nos institutos periciais é fundamental para o desenvolvimento da Antropologia Forense. Conforme Garrido, as instituições periciais e as academias representam os dois lados de uma mesma moeda[1].

Este trabalho teve por objetivo realizar a compilação das técnicas e apresentar a metodologia de trabalho utilizadas no Serviço de Antropologia Forense (SAFO) do Instituto Médico-Legal Afrânio Peixoto- RJ, além de avaliar os resultados obtidos nos seus dois primeiros anos de funcionamento. Com o fito de atingir tal objetivo foi realizada uma análise retrospectiva a partir dos laudos produzidos no SAFO.

CAPÍTULO 1: Retrospective analysis of forensic anthropology cases investigated by the Legal Medicine Institute of Rio de Janeiro State, Brazil

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RETROSPECTIVE ANALYSIS OF FORENSIC ANTHROPOLOGY CASES INVESTIGATED BY THE LEGAL MEDICINE INSTITUTE OF RIO DE JANEIRO STATE, BRAZIL

Abstract

Forensic Anthropology plays an important role in forensic investigations. The application of its concepts, from the crime scene to the laboratory, is essential to avoid that traces should be ignored or lost during a criminal investigation on human skeletal remains. A Forensic Anthropology Office was set up in the State of Rio de Janeiro by the end of 2010

with the purpose to aid in criminal investigations and to cut operational time and public costs with other time-consuming, more expensive examination techniques. In 2011 and 2012 the Anthropology Office received 66 examination requisitions comprising 74 human skeletal remains. The biological profile established after skeletal remains were investigated showed that the sample was made up mainly of male subjects (80%), caucasian (32%), young-adults ranging from ages 21-50 (54%), considered as the risk group. Injuries most frequently observed were blunt trauma (33.3%), followed by projectile trauma (31.4%). The most susceptible body regions were the head and neck, affected in 42% of cases. The highest correlation between type of trauma to a specific body part was observed with gunshot injuries to the head-neck region, corresponding to 27.3% of results. Gunshot trauma represented 52.1% of injuries found on the head and neck. Only 18.8% of human remains recovered for examination contained more than 95% of all skeletal bones. Only 7 (10.1%) of 47 completely skeletonized remains had more than 50% of bones recovered. This shows delays in locating human remains and its continuing decomposition pose a marked reduction in the amount of bones recovered, confirming the need for trace collection to be carried out by trained professionals. 80% of incoming cases came from 18 of the 160 districts of Rio de Janeiro, indicating a great prevalence of human remains located restricted to a few areas where violence is present.

Keywords: FORENSIC ANTHROPOLOGY POPULATION DATA; FORENSIC SCIENCE; FORENSIC ANTHROPOLOGY; FORENSIC ODONTOLOGY; ANTHROPOLOGY.

INTRODUCTION

Rio de Janeiro is a large city, with around 6 million inhabitants and area of 1,200 km^2, according to the 2010 census carried out by the Brazilian Institute of Geography and Statistics (IBGE, portuguese abbreviation). The great social differences, where luxurious houses and wooden shacks share the same view to the blue sea, provide, for some, ideal ground for violence to germinate. The great land extension, presence of rivers, mounds, lakes, mangroves and forests, as well as outcast areas where the State has only recently attempted to stand ground, may function as clandestine graves; the tropical weather and

rich and abundant fauna accelerate decomposition, decreasing the time lapse and viability for a conventional necropsy.

World famous for hosting major national and international events that periodically gather thousands of people of various nationalities, Rio de Janeiro is one of the most important cities in Brazil under the political, cultural and economic standpoints. Famous events such as Carnival and Copacabana´s New Year´s Eve are held annually. Over the last years the city hosted the Federation´s Cup, World Youth Day and Fifa´s World Cup, and is getting ready for the 2016 edition of the Olympic Games. These major events require special planning due to the growing threat of attacks carried out by terrorist organizations. The presence of a Forensic Anthropology (FA) specialist within the disaster victim identification crews (DVI) meets part of the requirements necessary when faced with the terrorist threat.

In the 1960´s and 1970´s, Rio de Janeiro staged one of the main centers of resistance to the military government, and the State faced several charges of human rights violations [1,2]; searches for missing persons were performed in various locations, including Ricardo de Albuquerque Cemetery [3,4] and, until this day, human rights violations still occur in districts dominated by the narcotraffic or by paramilitary groups. Forensic Anthropology employs excavation techniques developed by Archeologists to approach victims of drug dealers, serial crimes, massacres, political crimes, homicides and others [1–3,5–9].

In the State of Rio de Janeiro, the Forensic Anthropology Office (SAFO, portuguese abbreviation) was established in October 2010 within Afrânio Peixoto Legal Medicine Institute (IML-AP, portuguese abbreviation), linked to the Technical-Scientific Police Department branch of the Civil Police of Rio de Janeiro State. Therefore, as in most Brazilian States, the forensic examination is subordinated to the Public Security Secretary, that is, constitutes a police unit [6,10–12].

SAFO´s establishment generated demand for specialized professionals, which contributed to gather all field professionals in the country, and inspired the creation of the Brazilian Association of Forensic Anthropology (ABRAF, portuguese abbreviation) in September 2012, encouraged and supported by the Forensic Anthropology Society of

Europe (FASE) and, similar to the latter, aims to contribute to the specialize, homogenize and publicize FA concepts [13,14].

The aforementioned demand for professionals to act in forensic institutions should be supplied by Universities, leading to the creation of careers and development of research that in the future will offer back scientific basis and support. Forensic and academic institutions are two sides of the same coin [2,6].

Proper qualification and the adoption of incentive policies towards the scientific police contributes to the investigation process and helps decrease impunity, while its inappropriate functioning paves the way for a raise in violence. Rodrigo Garrido (2011) alerts to the difficulties generated by the distancing between forensic and academic institutions, and states that their approximation and strengthening support and add consistency to court decisions, being fundamental to the confrontation of violence. This process depends on the administrative and financial autonomy of forensic investigation organs [4,6,7]. The Nina Rodrigues Legal Medicine Institute, in Bahia, and the Center of Legal Medicine (CEMEL), in Ribeirão Preto, are well succeeded examples of ongoing partnerships between institutions [2,6,8].

Forensic Anthropology is the science that brings together concepts of Physical Anthropology and Forensic Sciences [10]. Its routine includes search for trace evidence during the examination of skeletal remains, aiming to identify the victim, analysis of traumatic injuries that may have occurred and reconstitute all events leading to death, including an estimate of the time of death, or *postmortem* interval (PMI) [5,11,13,15].

The application of FA concepts is not restricted to skeletonized remains, [12] and is applicable in cases of age estimation of live subjects without documents; identification and age estimation of criminals and crime victims of video recorded felonies, such as child pornography [13,15]; verification of age of majority of criminals is also a part of the anthropological analyses group [16]; and in the event of mass disasters, as well as in crimes against humanity and human rights violations [1,11,15,17], especially when clandestine graves are located.

The complete and detailed examination of the crime scene represents an element of prime importance to crime solving. Every time an investigation involves buried corpses, it

is mandatory that the search for remains be made using archeological excavation techniques, carried out by trained professionals, in a way that no trace may be lost or destroyed [1,3,5,10,11,13,15]. The employment of such excavation techniques tend to be very helpful in cases involving narcotraffic victims, serial crimes, massacres, political crimes, homicides and others [1–3,5–9].

Faced with such a broad field of work, it is doubtless that FA is a multidisciplinary science that embraces anthropologists, archeologists, medical doctors, dentists, biologists, biomedical professionals, among others, acting individually or as a team, provided they have been adequately trained [11].

Efforts are being directed towards enabling the SAFO to deploy to the field of human remains detection, so it can collaborate more efficiently with crime elucidation. As stated by Cattaneo (2006), FA today lies way beyond calipers and osteometric tables [13].

In Brazil, FA lacks support to undertake research with the aim to identify the peculiarities of the local population, and thus validate the techniques used in forensic examinations. The first step is to create an osteological collection that reflects the current population. For example, the Piracicaba Dental School (FOP-UNICAMP portuguese abbreviation), is developing with the technical support of the ABRAF, a skeletal collection consisting at this first stage of 500 complete, catalogued specimens from the current, local population. The perspective is to reach 1.000 specimens by the end of 2015.

Aware of the contribution FA offers to criminal case elucidation, and consequently to decrease crime [3], the aim of this study was to collect and organize data produced by the SAFO. The secondary objectives were to present its examination protocol and to identify the steps of action, where much effort is still necessary in order to increase the quantity and quality of traces recovered, so that the investigation efficiency may be improved.

MATERIAL AND METHODS

Research was analyzed and approved on June 11th 2014, by the Ethics Committee on Research of FOP-UNICAMP, under registration number 040/2014, and authorized by the Technical-Scientific Police Headquarters (DGPTC, portuguese abbreviation) of the State of Rio de Janeiro.

The study comprised a retrospective analysis of information derived from individual examination reports generated by the SAFO of IML-AP in the years of 2011 and 2012.

Data were extracted from each report pertaining to the site of corpse location; time elapsed from death; biological profile: sex, age, ancestry, stature, laterality and additional elements that might contribute to identification; and trauma analysis, including search for cause of death and for any other traces that may help clarify its circumstances.

All data were collected by two SAFO forensic examiners.

Over these two years, 66 examination requisitions were received, and each generated a report. Of these 66 requisitions: 6 corresponded to non-human material; other 3 represented material without forensic implications, 2 consisted of anatomical material discarded from study institutes and 1 consisted of archeological material; and another one corresponded to a complementary examination requisition for a previously located skeleton, already accounted for statistically.

The remaining 56 requisitions actually comprised skeletal remains of a total 74 different individuals, due to the fact that in 9 cases there were bones from more than one person commingled.

Five out of 74 skeletal remains did not enter the SAFO laboratory because they had been positively identified by the Forensic Dentistry Office or through Papiloscopy, due to the presence of soft tissue remains. Therefore 69 skeletal remains were examined and the resulting data compose the present study.

All examination requisitions informed the site of skeletal recovery, so all 74 cases were accounted for statistically.

RESULTS AND DISCUSSION

Taphonomy

Quantity of bones recovered

Out of 56 requisitions, 47 (83%) presented skeletal remains of a single individuals; whilst in other 9 (17%) commingling of skeletal remains took place. These nine requisitions comprised a total of 27 individuals, although the single requisition with the highest number of subjects investigated presented skeletal remains of six different people.

As previously mentioned, laboratory analyses were centered on 69 skeletal remains because 5 of 74 had been identified previously to entering the SAFO.

Less than 18.8% of skeletal remains recovered comprised more than 95% of body bones (Table 1).

Stages of decomposition of recovered material (taphonomy)

It was observed that 38 (55.1%) bones examined showed signs of degradation, indicating they had been exposed to the environment for a long time before being located.

Besides the skeletal remains, the laboratory received partially saponified corpses, partially mummified corpses and even at advanced stages of decomposition, namely bloat and liquefying stages (Table 2).

A total of 47 (68.1%) of 69 skeletal remains were fully skeletonized, that is, presented no soft tissue remains or cartilages. Of these, only 7 (10.1%) had more than half the bones recovered, proving that the longer it takes for remains to be located, and with its subsequent decomposition, there is a marked reduction in the amount of bones recovered.

Sex analysis

Of the 69 skeletal remains, 65 underwent sexual dimorphism analysis, and the anthropological examination concluded that 55 (80%) displayed male characteristics and 10 (14%) displayed female characteristics. All skeletal remains that comprised at least the skull, pelvis, femur or humerus allowed for gender determination. Only 4 skeletal remains (6%) did not present at least one of the cited bones, and were therefore disconsidered for the examination.

Pelvic bones represented the first choice for verifying sexual dimorphism, followed by the skull. Morphological characteristics were analyzed and organized into a decision table with twelve anatomical items to be analyzed on the pelvis [18] and fourteen on the skull. Landmarks were selected from the study by Buikstra, Ubelaker e Walker [15,19–21]. Each site was observed and classified according to the characteristics observed, as male, female or undetermined. The method for sex determination based on pelvic metric characteristics, known as DSP, was also applied [15,22].

Age analysis

As far as age was concerned, it was observed that were not received fetuses or individuals with age ranging from 0 to 10 years. 10% of the sample consisted of individuals with age ranging from 11 to 20 years, 34% were included in the age ranging from 21 to 30 years, 20% were in the range between 31 to 50 years and, finally, 20% were included in the group above 50 years. Another 16% did not contain the bones needed for the exam.

Individuals with age ranging from 21 to 30 years, represents the group with highest associated risk, followed by the age range of 31 to 50 years.

As for age estimation, methods used in young adults were based on dental development tables developed by Nicodemo, Moraes e Medici Filho [23]; on Ubelaker´s chart cited by Couto [24] and on epiphyseal plate calcification described by Buikstra e Ubelaker [21]. When it came to adult skeletons, analysis was based on the stage of development of the pubic symphysis, proposed by Suchey&Brooks [15,24]; the first costal arch by DiGangi *et al*. [25,26]; the fourth costal arch [27] and the auricular surface [28]. Lamendin´s analysis was applied as often as possible [15,29,30].

Ancestry analysis

In 31 (45%) of 69 cases, an ancestry research could not be carried out because of missing skulls or due to its fragmentation. From the 38 human skeletal remains that allowed for an ancestry analysis, it was concluded that 22 (32%) displayed predominantly caucasoid characteristics, 14 (20%) displayed predominantly negroid characteristics and 2 (3%) displayed predominantly mongoloid characteristics.

The skull represents the main point of interest while investigating ancestry. The face, specially the nose area, were morphologically analyzed, as advised by Bass [31,32], Rhine [33], Gill [33–36] e Krogman and Mehmet [37]. The morphological analysis of the face is known as the most assertive means to evaluate geographical origin.

While examining the skull, a decision table of 17 anatomical characteristics was observed. The six craniometric indices proposed by Arbenz were also applied [23]. Post cranial skeleton was used only to confirm the findings of the skull, where tibiofemoral and radiohumeral indices cited by França were applied [38].

Stature analysis

Stature determination was based on the table by Trotter & Gleser cited by Couto [24], and by the table proposed by Mellega [39]. The latter represents a study conducted on the brazilian population, offering good results when reproduced. Height is a parameter that should be evaluated with restriction because, in Brazil, height is only measured for military service purposes around the age of 18, when growth has yet to cease. As often as possible, it is suggested that ratios be used based on photographs of the missing person, and that additionally, measurements of siblings, should there be any, be taken as a frame of comparison.

Handedness analysis

This analysis was introduced to the formal examination protocol at the end of 2011 after being considered a relevant determinant that may aid in identification. Since then, 46 skeletal remains were examined, although only 10 could undergo the analysis to determine the side of dominance, because they comprised bones of the appendicular skeleton of both left and right sides. One of the exams was inconclusive and other 9 suggested individuals were right-handed.

The protocol followed was the same that has been used and supported by CEMEL, in Ribeirão Preto for more than 10 years [8]. It is based on a decision table that analyzes and compares eight anatomical sites on both sides of the upper appendicular skeleton.

Cranio-Facial Reconstruction (CFR) and Skull-Photo Superimposition (SPS)

Between 2011 and 2012, two exams with SPS and 3 exams of CFR were carried out. Both SPS exams demonstrated coincidence between facial and craniometric landmarks, as did facial characteristics match. Later, DNA tests confirmed the results obtained by approximation.

The CFR was carried out digitally and still cannot function as a means of attracting the missing person´s family members because its results cannot be released to the general public. In one case where the family waited for the DNA result to confirm identity of

skeletal remains, the CFR was applied and the family recognized the result presented as similar to the missing person´s appearance.

The techniques of overlapping images and forensic facial approximation were used eventually by the SAFO and are not part of the routine protocol. The entire process is usually concluded in a single day [40].

Identification

In its first two years functioning as a formal unit, SAFO voided one case of corpse identification that had been wrongly recognized by family members. In another case, the SAFO was responsible for the reinclusion of skeletal remains as a possible match after pointing out coincidences between information obtained from family members and the victim´s biological profile. A DNA test confirmed SAFO´s findings.

The SAFO positively identified a case where the biological profile, the CFR and SPS matched, and the anterior teeth could be observed, including the gaps between them.

It should be noted that at least 29 of 69 skeletal remains examined by the SAFO presented characteristics that could contribute to the identification process, such as dental fillings, fractures and *antemortem* pathologies, characteristic anatomical variations such as: septal and sternal foramina, bifid ribs, metopic suture, sacral bifid spine, sutural bones, ankylosis, unerupted teeth, osteoms. Again, it is necessary to bring attention to the fact that a missing person´s database could highly improve the statistics of positive identifications.

Analysis of trauma injury

In the first stage of trauma injury investigation, the triple distinction was made between *antemortem, perimortem* and *postmortem*.

From the 69 skeletal remains analyzed, 44 (63.8%) showed some sort of skeletal trauma, namely: blunt force, burning, sharp force, gunshot or an association between these. In 25 (36.2%) of 69 skeletal remains, no trauma injury was observed.

The most frequently observed injury was blunt trauma (33.3%), followed by gunshot (31.4%), sharp-blunt trauma (21.6%) and burning action (13.7%). Six out of 44 skeletal remains presented an association between more than one type of trauma.

The head-neck region was affected in 42% of the 69 cases, representing the most frequently affected location, and having been subjected to all four types of trauma injury evaluated. The upper arms were affected in 13% of cases, the chest-abdomen region was affected in 27.5%. Finally the hip region was affected in 13% of cases and the lower members in 14.5%. In some cases the five body regions were affected.

The highest correlation found between a type of trauma and a specific body part was the gunshot action to the skull-neck region, corresponding to 27.3% of results. Of all gunshot injuries, 52.1% were located on the skull-neck region.

Correlation between site of location and trauma

Of all cases investigated, 80% were located in one of 18 out of 160 districts found in the city of Rio de Janeiro, indicating a strong prevalence concentrated over few areas, and showing that some specific regions display above average violence numbers.

An association between location sites and type of trauma injury could also be identified, indicating that criminals acting within a specific district display a *modus operandi*, as 15% of victims who suffered multiple sharp-blunt injuries, in this case the scattering of body parts, were found in the surroundings of Ilha do Governador district, while gunshot injuries to the head and neck prevailed (25%) in Realengo district.

Trauma and biological profile correlation

The biological profile established by skeletal remains investigation evidenced that sample was mainly comprised by men (80%), caucasoid (32%), young-adult with age range between 21-50 (54%), representing the risk group in 11.59% of studied cases.

The authors have presented the methods used in the examinations and the results obtained after two years of service. Results are still limited due to the reduced sample size, but the presentation of the method employed is greatly relevant because it exposes techniques that have proved efficient.

CONCLUSION

It was possible to point out the existence of a risk group, made up of young-adult, male caucasians.

It is noteworthy that a high number of skeletal remains should be located repeatedly in a few regions, and that patterns of trauma can be associated with specific districts, thus establishing a correlation between types of homicide and certain parts of town.

Gunshot to the head and neck was the most common combination of trauma and body injury.

It is important that the establishment of biological profiles and trauma injury analysis be carried out by trained and experienced professionals in the forensic anthropology field, so that trace investigation can be optimized.

Acknowledgements

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Table 1. Descriptive statistics of recovered bones.

Bones recovered per individual	**2011**	**2012**	**Total**	**%**
1- complete or almost complete	6	7	13	18.8
2- almost complete, most long bones and many small bones	1	3	4	5.8
3- majority of long bones and small few or rare small bones	6	1	7	10.2
4- few long bones e few small bones	10	8	18	26.1
5- few long bones	13	9	22	31.8
6- bone fragments	1	4	5	7.3
Total	37	32	69	100

Table 2. Descriptive statistics of body taphonomy.

Stage of tissue decomposition at the moment of recovery	**2011**	**2012**	**TOTAL**	**%**
1- Degrading bones	18	20	38	55.1
2- Skeletonized	8	1	9	13
3- Partially skeletonized	9	1	10	14.5
4- Putrid – presence of soft tissue	1	2	3	4.3
5- Calcined	0	4	4	5.8
6- Mumified/Skeletonized	0	4	4	5.8
7- Saponified/Skeletonized	0	1	1	1.5
Total	36	33	69	100

Partially skeletonized – presence of cartilages, little soft tissue, putrid odor.

Skeletonized – entire bones, absence of cartilages or soft tissue, and lack of putrid odor.

DISCUSSÃO

Os laudos, objetos de análise desta dissertação, representam a materialização da atividade pericial e a atividade pericial realizada nos Institutos de Medicina Legal, sobre o cadáver, chama-se necropsia.

Toda necropsia tem por principais objetivos a identificação cadavérica, a determinação da causa da morte e o levantamento de todos os vestígios relacionados ao fato criminoso e esclarecedores do mesmo.

A antropologia forense estabelece a identificação cadavérica quando, por exemplo, se depara com próteses ou placas de fixação ósseas numeradas, que possam levar a um prontuário médico ou odontológico; e, também, nos casos onde se pode comparar exames radiográficos *antemortem* e *postmortem* dos ossos.

A determinação do perfil biológico não identifica um indivíduo, mas permite direcionar a identificação ou excluir a identidade. No IMLAP o perfil biológico é determinado a partir do estudo do sexo, idade, ancestralidade, estatura e destreza manual.

O sexo, a partir das ossadas, pode ser obtido aplicando-se métodos baseados nas características métricas ou morfológicas. No IMLAP foram frequentemente utilizados o método do DSP [7] e as tabelas/ quadros de decisão (Apêndice 1) desenvolvidos a partir dos trabalhos de Buikstra[8], Ubelaker[8] e Walker[9].

Para a obtenção da idade foram aplicados os estudos propostos por Kunos[10]; Buikstra[8] e Ubelaker[8]; Suchey e Brooks[11]; Lamendin[12]; Lovejoy[11]; a cronologia da erupção de Ubelaker[8]; e a cronologia da erupção de Nicodemo, Moraes e Medici Filho[13].

A ancestralidade é obtida por meio da aplicação dos índices de Arbens[13] e da utilização de uma tabela/ quadro de decisão (Apêndice 2) baseada nos estudos de Bass[14], Rhine[15], Gill[16], Krogman[17] e Mehemet[18].

O estudo da estatura é realizado por meio das analises sugeridas por Trotter e Gleser citado em Couto[19] e pelo estudo de Mellega[20].

A lateralidade é obtida por meio de uma tabela/ quadro de decisão sugerida nas atividades do Serviço de antropologia forense do CEMEL[21].

Por fim, cabe informar, que os estudos de sobreposição de imagens do cr6anio e da face e a reconstrução facial forense são técnicas que eventualmente são utilizadas no SAFO para colaborar com a busca da identidade.

CONCLUSÃO

A partir das análises realizadas neste estudo:

- Foi possível perceber que as ossadas examinadas apresentaram um perfil biológico que representa um grupo de risco formado por indivíduos adultos-jovens do sexo masculino com características predominantemente caucasoides;

- Verificou-se que a ação perfurocontundente na região crânio-cervical foi o trauma observado com maior incidência;

- Ficou notória a existência de um índice mais elevado de ossadas oriundas de poucas regiões, além de padrões de trauma repetidos e associáveis a determinados bairros, revelando uma associação entre o tipo de homicídio e determinadas regiões, sugerindo um *modus operandi*;

- Tornou-se claro que a aplicação de protocolos para a determinação do perfil biológico e a análise traumatológica, por profissionais treinados e familiarizados com a rotina antropológica é fundamental para o aumento na quantidade de vestígios levantados pelo exame especializado.

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APÊNDICE 1: TABELAS/ QUADROS DE DECISÃO PARA OBTENÇÃO DO SEXO

CRÂNIO	MASCULINO	Ind.	FEMININO
1- aspecto geral	( ) Grande		( ) Pequeno
2- peso do crânio	( ) Pesado		( ) Leve
3- fronte	( ) Inclinada		( ) Vertical
4- glabela	( ) Projetada		( ) Discreta
5- arco superciliar	( ) Projetado		( ) Discreto
6- rebordo supraorbitário	( ) Rombo		( ) Cortante
7- articulação fronto-nasal	( ) Angular		( ) Curva
8- processos mastoideos	( ) Bem desenvolvidos (Crânio estável)		( ) Pouco desenvolvidos (Crânio instável)
9- processos estiloides	( ) Bem desenvolvido		( ) Pouco desenvolvido
10- linhas nucais	( ) Evidentes		( ) Pouco evidentes
11- Ínio	( ) Projetado		( ) Discreto
12- inserções musculares	( ) Evidentes		( ) Pouco evidentes
13- Mandíbula	( ) mais robusta		( ) Delicada, menos robusta
14- Gônio	( ) mais robusto		( ) Delicado, menos robusto

TOTAL DE CARACTERÍSTICAS MASCULINAS: _____.
TOTAL DE CARACTERÍSTICAS FEMININAS: _____.
CONCLUSÃO: ( ) Masculino; ( ) Feminino; ( ) Indeterminado.

PELVE	MASCULINA	Ind.	FEMININA
1- Predomínio	( ) Vertical		( ) Horizontal
2- Buraco pélvico	( ) Estreito		( ) Amplo
3- Ângulo sub-púbico	( ) Fechado		( ) Aberto
4- Forame obturador	( ) Oval		( ) Triangular
5- Ramo ísquio-púbico	( ) Grosso e reto		( ) Fino e côncavo
6- Crista medial ísquio-púbica	( ) Ausente/discreta		( ) Presente
7- Arco ventral	( ) Ausente		( ) Presente
8- Incisura isquiática maior	( ) Estreita e profunda		( ) Ampla e rasa
9- Superfície auricular	( ) Plana		( ) Projetada
10- Sulco pré-auricular	( ) Ausente		( ) Presente
11- Sacro	( ) Curvo		( ) Reto
12- Proporção asa/corpo	( ) Proporcional		( ) Asa longa

Total de características MASCULINAS:_____.
Total de características FEMININAS:_____.
Resultado: Predominância de características_____.

APÊNDICE 2:

TABELA/ QUADRO DE DECISÃO PARA OBTENÇÃO DA ANCESTRALIDADE

TABELA DE DECISÃO PARA ESTIMATIVA DA ANCESTRALIDADE			
	CAUCASÓIDE	**NEGRÓIDE**	**MONGOLÓIDE**
1- Altura craniana	( ) Alto	( ) Baixo	( ) Muito alto
2- Profundidade do crânio	( ) Curto	( ) Longo	( ) Muito curto
3- Depressão pós-bregmática	( ) Ausente	( ) Presente	( ) Ausente
4- Formato da órbita	( ) Angular	( ) Retangular	( ) Oval
5- Distância interorbital	( ) Curta	( ) Ampla	( ) Intermediária
6- Perfil facial	( ) Vertical (Ortognata)	( ) Projeção alveolar	( ) Projeção zigomática
7- Raiz nasal	( ) Projetada	( ) Não projetada	( ) Não projetada
8- Ponte nasal	( ) Alta	( ) Baixa	( ) Intermediária
9- Ossos nasais I	( ) Finos e compridos	( ) Largos e curtos	( ) Intermediários
10- Ossos nasais II	( ) Angulados entre si	( ) Planos entre si	( ) Angulados entre si
11- Espinha nasal	( ) Projetada	( ) Discreta	( ) Curta
12- Abertura piriforme	( ) Alta e Estreita	( ) Baixa e Larga	( ) Intermediária
13- Borda inferior da abertura piriforme	( ) Afilada e projetada	( ) Em goteira	( ) Intermediário
14- Forma da face	( ) Estreita	( ) Estreita	( ) Larga
15- Cúspide de Carabelli	( ) Presente	( ) Ausente	( ) Ausente
16- Oclusal do primeiro molar	( ) Mamelonada	( ) Estrelada	( ) Intermediária
17- Incisivos	( ) Em espátula	( ) Em espátula	( ) Em pá
Total de característica			

Predominância de características:
( )Caucasoide; ( )Negroide; ( )Mongoloide, ( )Indeterminada

ANEXO 1: COMPROVANTE DE SUBMISSÃO DE ARTIGO ONLINE – FORENSIC SCIENSE INTERNATIONAL

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ANEXO 2: PARECER DO COMITÊ DE ÉTICA

COMITÊ DE ÉTICA EM PESQUISA
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UNIVERSIDADE ESTADUAL DE CAMPINAS

CERTIFICADO

O Comitê de Ética em Pesquisa da FOP-UNICAMP certifica que o projeto de pesquisa **"Análise retrospectiva dos exames realizados no Serviço de Antropologia Forense do Estado do Rio de Janeiro, Brasil"**, protocolo nº 040/2014, dos pesquisadores Marcos Paulo Salles Machado e Eduardo Daruge Júnior, satisfaz as exigências do Conselho Nacional de Saúde - Ministério da Saúde para as pesquisas em seres humanos e foi aprovado por este comitê em 11/06/2014.

The Ethics Committee in Research of the Piracicaba Dental School - University of Campinas, certify that the project **"Retrospective analisys of the skills performed in the Forensic Anthropology Service of Rio de Janeiro, Brasil "**, register number 040/2014, of Marcos Paulo Salles Machado and Eduardo Daruge Júnior, comply with the recommendations of the National Health Council - Ministry of Health of Brazil for research in human subjects and therefore was approved by this committee on Jun 11, 2014.

Prof. Dr. Felippe Bevilacqua Prado
Secretário
CEP/FOP/UNICAMP

Profa. Dra. Lívia Maria Andaló Tenuta
Coordenadora
CEP/FOP/UNICAMP

Nota: O título do protocolo aparece como fornecido pelos pesquisadores, sem qualquer edição.
Notice: The title of the project appears as provided by the authors, without editing.