Prevalence of injuries of Brazilian Basketball National Team during 2002 season

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ABSTRACT

The aim of this study is to evaluate injuries, etiology and localization of Brazilian Basketball National Team during 2002 season. All data of this study was collected by the physician's team. The diagnosis performed was clinical, rarely complementary exams were used; 102 complaints were made by athletes during 2002 season (1/7/2002 – 10/9/2002) performing 6.37 injuries/athlete/season or 2.55 injuries/athlete/month; 64.7% (66/102 athlete's complaints) had no trauma relationship (muscle injuries, clinical diseases and tendinous injuries). The traumatic injuries were less frequent (36/102; 35.3%). The most frequent injury was ankle's torsion (13/102; 12.8%) followed by hand's trauma (9/102; 8.8%). By localization, the most common injuries were in legs (49/102; 48.0%), arms (14/102; 13.7%), thorax/abdomen (14/102; 13.7%), head and neck (3/102; 3.0%). The systemic diseases (headache, diarrhea, for example) were 21.6%. According to position in court, complaints from center players were the most common (45/102; 44.1%), mainly of traumatic injuries. Due to extreme contact sport, traumatic injuries in hands, thigh and ankle's torsion are most representative and the legs the most common stricken.

Key words: Injuries. Brazilian Basketball Team. Epidemiology. Sports.

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INTRODUCTION

Basketball is a sport of a beauty and a pace of its own. There are currently some 300 million players worldwide[1].

Its main features are brief and intense exertions performed in different paces, a set to jumps, runs, attack-defense coordinated movements, passes, shots, thus it demands a high degree of motion and coordination[2]. These physical, technical and tactical requirements make the training more strenuous and exhausting, demanding maximum effort from the athlete in seeking perfection. Thus, more fierce disputes, high training loads and more physical contact between opponents allow for a high level of injuries.

Basketball-oriented studies are still scarce, and follow several methodologies, so there can be no correlation among them.

MacKay et al[3] carried out a retrospective study on basketball injuries. Through the reports of complaints and injuries in matches and sports websites, and by interrogating assailed athletes, a total of 10.393 players, they reported that the rate of serious injuries, leading to the athlete to be away for a week or more, was of 2.89/1,000 participations. The most injured sites were in the lower limbs (LLLL): ankle joint (1.25/1,000 participations), followed by leg injuries (0.48/1,000 participations), and knee joint (0.29/1,000 participation).

The purpose of this study is to present injury prevalence, possible etiology, and site, in the Brazilian Basketball National Male Adult Team from July 1st, 2002 to September 10th, 2002, covering the training period and playing of the 14th World Basketball Championship.

MATERIAL AND METHOD

The data collected and presented in this paper refer to complaints of 16 athletes who, at different periods of time, were members of the Brazilian Basketball National Male Adult Team during the training period and/or the 14th World Basketball Championship, in 2002.

From the 16 athletes, only seven remained throughout the period of this investigation (July 1st to September 10th, 2002). The other players were excluded due to technical or medical criteria (one case of serious injury).

The age of the group ranged from 17 and 31 years (mean of 24.5 years; standard deviation of 4.3 years).

The diagnosis was basically clinical, from the medical history and physical examination. Only for some cases, additional tests were required.

The data was recorded and classified according to pre-established criteria for site, etiology and diagnosis, being considered **light** those injuries that did not prevent athletes from taking part in training or at a match; **moderate** are injuries that made the athlete to be away for one training day and/or match; **severe**, when athlete's absence was longer than one training day and/or match.

Complaints of spinal pain (presented in this paper as chest/abdomen), among them, neck pain, back pain or lower back pain, were considered as non-traumatic, as no direct trauma was involved: they were related to the motions and movements from the sport itself.

The proportion of exclusion table presented in the results shows a proportion for each specific injury that made the subject to be away from his activities for at least one day.

All complaints made to the medical department were considered.

All the athletes were informed on the investigation, voluntarily agreed to the publication of data, and signed a consent form that ensured privacy of their personal information.

TABLE 1
Complaints from the Brazilian Basketball National Team athletes according to site and etiology

	Number of complaints	Traumatic	Non-traumatic	Percentage (%)
LLLL	49	21	28	48.0
Medical	22	–	22	21.6
Chest/abdomen	14	1	13	13.7
UULL	14	11	3	13.7
Head	3	3	–	3.0
Total	102	36	66	100.0

TABLE 2
Injuries in the Brazilian Basketball National Team athletes according to frequency, exclusion and etiology

Complaint	Total percentage (%)	Exclusion (%)*	Etiology
Ankle sprain	12.8	23.1	Trauma
Contusion in the hand	8.8	11.1	Trauma
Headache	6.9	0.0	Non-trauma
Sore throat	6.9	0.0	Non-trauma
Injury in adductive area	6.9	14.3	Non-trauma
Low-back pain	6.9	14.3	Non-trauma
Leg muscle injury	5.9	33.3	Non-trauma
Tendinitis of the patella	3.9	50.0	Non-trauma
Others	41.1	20.9	–

* percentage of exclusion for each specific injurty, preventing activity for at least one day.

TABLE 3
Severity of the injuries in Brazilian Basketball National Team athletes

Grade of injury	Amount (number)	Percentage (%)
Grade I – light	59	57.8
Grade II – moderate	33	32.4
Grade III – severe	10	9.8
Total	102	100

RESULTS

After assessing the collected data, it was seen that injuries had higher prevalence in the LLLL, followed by systemic medical complaints (headache, diarrhea, among others), upper limb (UULL) injuries, chest/abdomen injuries, and complaints in the area of the head. As to the etiology of the complaints, it was noted that those not related to trauma were the most frequent ones: 66 (64.7%). Traumatic injuries were 35.3% of all complaints, and were basically related to direct trauma and sprain ankle (12.8%) (table 1).

Among the most common injuries, according to diagnosis, the most frequent were ankle sprain (12.8%), followed by direct trauma in the hands (8.8%), and medical systemic diseases, such as headache and sore throat (table 2). In this table, the etiology of the injury (whether traumatic or non-traumatic) and the proportion of exclusion due to the injury for one or more training days and/or matches are also correlated.

As to the severity of the injuries, 57.8% were light, 32.4% moderate, and 9.8% severe (table 3).

For LLLL, center players reported complaints the most, followed by forwards and guards (table 4).

For chest and abdomen, also center players reported complaints the most: 10 (71.4%).

Head injuries were the least frequent (only two complaints from guards and one from center players).

TABLE 4
Relationship between player position and site of complaint, among Brazilian Basketball National Team athletes

	Lower limbs	Upper limbs	Chest/ abdomen	Head	Medical systemic	Total
Guard	8	4	2	2	5	21 (20.6%)
Forward	19	6	2	–	9	36 (35.3%)
Center	22	4	10	1	8	45 (44.1%)
Total	49	14	14	3	22	102

Medical complaints were of high frequency (21.6%), being 40.9% from forwards, followed by center players (36.4%) and guards (22.7%) (table 3).

It was noted that the position the athlete plays influences the number of complaints, being center players assailed the most (44.1%), followed by forwards (35.3%) and guards (20.6%) (table 4).

DISCUSSION

The studies addressing basketball-specific injuries are few and not correlated. Some studies that tackle overall sports injury make only a comparison among the different sports. In these studies, basketball is considered to be a sport with high proportion of injuries, coming after soccer, handball and ice-hockey[4].

Some studies state that female athletes have increased risk for injury[4-6]; however, Messina et al[7] do not report significant differences among genders. They also reported that the risk of injury, for both genders, is higher during the matches compared to training. Gantus & Assumpção[8] published discrepant data, reporting that 46.8% of the injuries occur at matches, and 53.2% in the training sessions. Theirs was an epidemiological study on locomotor injuries in basketball athletes during the 1998 season, with data collected through a questionnaire.

There are also a high number of complaints related to injuries in the face, followed by ankle sprain, tendinitis of the patella, contusions in the hand, and spinal pain. Data similar to these were found in our study, except for injuries in the face, which represented only 3.0% of the total of injuries, a proportion similar to the one found by Cohen & Abdalla[9], who reported 4.1% of the total of injuries.

In our investigation, we found the LLLL to be assailed the most (48.0%), the main complaint being ankle sprain (26.5% of LLLL injuries and 12.8% overall). Predominance of pain or injuries in ankle and knee are mentioned in a number of studies, and ankle joint is one of the areas, or rather the area of highest occurrence of injuries in these athletes[4-13]. According to Cohen & Abdalla[9] and Zvijac & Thompson[14], the use of bandages or stabilizers on ankle joint may lessen or minimize sprain lesions.

Complaints about knee joints were 5.9% of the total in our study, differently from De Loes et al[5], who found a rate of 10%, and Gantus & Assumpção[8], who found 18.7% of injuries for this joint.

The UULL account for 13.7% of injuries, being direct trauma on the hands (contusion) the most frequent injury of this region, with 57.1% and 8.8% of the overall injuries, which is similar to the proportions found by Messina et al[7], Gantus & Assumpção[8], and Ray et al[15], of 9%, 13.6% e 9%, respectively, and lower to the proportion found by Cohen & Abdalla[9], of 20.8% of the total of injuries. Such hand lesions happen particularly when fighting for the ball, normally under pressure from the opponent[8].

In this study, systemic diseases (bacterial, viral, among others) were accountable for 21.6% of the complaints, a proportion higher than of injuries in the chest/abdomen, upper limbs and head. Regarding systemic diseases, we did not find comparative data in the literature.

Complaints of spine pain were also frequent (12.8%), due to the characteristics of being a high intensity and impact sport, in addition to individual features of each athlete (low flexibility and improper posture), with similar figures found by other studies (12.3%, 13.2% e 11.5% respectively)[8,16,17].

In spite of ankle sprains and hand contusions being the most frequent cause of complaints and having a traumatic etiology, the overall number of non-traumatic complaints was higher (64). The fact that this study was carried out with at the end of their teams' season, with national and continental championships over, helped our statistics, as these athletes are in a descending stage on a physical perspective. To this factor, one adds a high training requirement, higher than they have in their teams, of about 6 hours/day, overloading soft contractible (belly muscle) and non-contractible (tendons, ligaments, fascias), increasing proneness to their injury. Repetitive effort and muscular fatigue-related muscle injuries and tendinitis account for about 22.8% of complaints, a proportion similar to the one found by Gantus & Assumpção[8], of 22.7% for such injuries.

As to the severity, there were 57.8% of light, 32.4% of moderate, and 9.8% of severe injuries, slightly different figures than the found by Cohen & Abdalla[9], of 46% light,

39% moderate, and 14.4% severe injuries. Discrepant were the results from Gantus & Assumpção[8], of 28.9% light, 37% moderate, and 33.5% severe lesions, and from Mcleod & Kirkby[18], of 34% light, 46% moderate, and 20% severe injuries; their studies showed a higher proportion of moderate injuries. One should stress that this difference is likely due to the criteria established by the authors, and not by complaints of injuries of different nature.

As to their position in court, of the 16 athletes investigated, 43.7% were center players, 37.5% were forwards, and 18.8% were guards, data similar to those of Gantus & Assumpção[8], who investigated 40.6% center players, 30.6% forwards and 28.8% guards, while Cohen & Abdalla[9] investigated 42.8% forwards, 33.7% center players, and 23.5% guards. This difference among the studies may be explained by the fact that some athletes do not play in a fixed position, but they rotate positions according to the moment or situation at the match, which may reflect in the collection of data.

We also correlated complaints of pain and the athlete's position in court. Center players suffered the highest number of injuries (44.1%), followed by forwards (35.3%) and guards (20.6%). Center players were the ones who complained the most about pain caused by hands and chest/abdomen traumatic injuries and sprain ankle. Most of such complaints were reported after moves in the free-throw lane, due to higher physical contact to catch rebounds or for short shots. On the other hand, they have less complaints on non-traumatic injuries, probably because their movements are not as intense as forwards and guards, who presented a high rate of non-traumatic injuries. Ankle injuries (particularly sprains) happen mostly at landing, which has been confirmed by MacKay et al[11]. Gantus & Assumpção[8], Cohen & Abdalla[9] e Raschka et al[13] found a high rate of traumatic lesions due to direct contact in hands and face, in addition to ankle sprains in center players when attempting to get a rebound; this is similar to what we found, except for face injuries, which corresponded to 2.2% of the overall injuries in the center players we investigated.

In this study, we found an average of 6.37 injuries/players/season, and a rate of 2.55 injuries/player/month, which is close to the data found by Colliander et al[6], of 8.6 injuries/season; Gantus & Assumpção[8], of 7.7 injuries per athlete; and Henry et al[16], with 8.6 injuries per player. MacKay et al[3] reported a rate of 18.3 injuries per 1,000 hours of basketball played.

CONCLUSION

LLLL (48.0%) and UULL (13.7%) injuries were the most frequent ones. In spite of being a sport of much physical contact, non-traumatic lesions (64.7%) were more frequent than traumatic ones (35.3%). According to our standards, light injuries were the most representative, with 57.8%, followed by moderate, with 32.4%, and severe lesions, with 9.8%. Center players reported a higher proportion of complaints, followed by forwards and guards, respectively. Our study found an average of 6.37 injuries/season, and a rate of 2.55 injuries/player/month. Knowing the most frequent injuries and identifying their likely cause is quite important for planning and preventing injuries, which adds to the performance of the athletes.

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